Operating Instruction Manual

# QViS

Development Tool

**Hilscher Gesellschaft für Systemautomation mbH**

**www.hilscher.com**

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# 1 Introduction

## 1.1 About this Manual

This manual contains a description on working with the visualization software QViS, developed by Hilscher Gesellschaft für Systemautomation mbH. It includes instructions on installing the software, creating projects and several application examples.

### 1.1.1 Conventions in this Manual

Instructions, the result of an action step or notes are marked as follows:

**Instructions:**

➢ <Instruction>

or

1. <Instruction>
2. <Instruction>

**Results:**

➪ <Result>

**Notes:**

**Note: <Note>**


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### 1.1.2 List of Revisions

| Revision | Date | Chapter | Changes |
|---|---|---|---|
| 1 | 2010-03-05 | Everything | Created |
| 2 | 2010-03-12 | Everything | Updated |
| 3 | 2010-03-18 | Everything | Updated |
| 4 | 2010-03-26 | Everything | Updated |
| 5 | 2010-04-12 | Page Editor | Added ScaleMaker |
| 6 | 2010-06-18 | Importing Variables | Updated Example "Importing Variables", added Appendix Hilscher XML Format |
| 7 | 2010-07-14 | Hilscher XML Format | Extended data types |
| 8 | 2010-10-11 | Element Symbol/ Text Project Settings | The elements "Dynamic Text" and "Static Text" were consolidated to the element "Text."<br>The elements "Dynamic Symbol" and "Static Symbol" were consolidated to the element "Symbol."<br>Added Command Interface |
| 9 | 2010-12-13 | Variables | Variables were extended by the property "Multiplier." |
| 10 | 2011-03-18 | Everything | Updated |
| 11 | 2011-03-30 | Page Editor | Condition Blink was deleted |
| 12 | 2011-06-27 | Element Button | Deleted Print Functions |
| 13 | 2011-10-18 | Chapters 1 to 3 | Replaced screenshots, revised and supplemented texts. |
| 14 | 2012-01-20 | Chapters 4 to 6<br><br><br><br><br>Chapters 1 to 3 | Chapter 4) Replaced screenshots, revised and supplemented texts.<br>Chapter 5) Deleted XML Format Description for Importing Variables, as it is only relevant for OEM drives.<br>Chapter 6 became Chapter 5.<br>Corrected formatting errors and spelling mistakes, textual adaptations. |
| 15 | 2012-07-12 | 3.3.7.3 | Added the note on "modify variable directly" in 3.3.7.3. |


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# 1.2 Contents of the Product CD

- This Operating Instruction Manual is a part of different products and distributions. Apart from other components, the scope includes:
- QViS (configuration tool for Windows PCs)
- QViSRT (Runtime/Firmware)
- Documentation
- Examples

## 1.2.1 Directory Structure of the CD

Please refer to the CD Booklet for the directory structure and exact content of the product CD.

## 1.2.2 QViS Documentations

The following overview of documents provides details in which manual you can find further information on topical contents.

| Manual | Content | Document Name |
|---|---|---|
| Operating Instruction Manual QViS | Manual for QViS Development Tool | QViS - Development Tool OI xx EN.pdf |
| Application Note: QViS Driver Configuration | Fieldbus Configuration in Detail | QViS-DriverConfiguration_AN_DE.pdf |
| Application Note: QViS Command Interface | Controlling Several QViS Functions via any Drive out of the PLC | QViS-CommandInterface_AN_DE.pdf |

# 1.3 Reference to Hardware/Software

## 1.3.1 Hardware

QViS can create visualizations for QViS Runtimes (QViSRT) that run on different hardware platforms under various operating systems. For this reason, the information in this manual has been written in the most general terms possible.

## 1.3.2 Software

The prerequisite for using QViS is a Windows XP or Windows 7 compatible computer. Furthermore, the .NET Framework in Version 3.5 must be installed.


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# 1.4 Legal Notes

## 1.4.1 Copyright

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- for the design, construction, maintenance or operation of nuclear facilities;
- in air traffic control systems, air traffic or air traffic communication systems;
- in life support systems;
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The delivered product (including the technical data) is subject to export or import laws as well as the associated regulations of different counters, in particular those of Germany and the USA. The software may not be exported to countries where this is prohibited by the United States Export Administration Act and its additional provisions. You are obligated to comply with the regulations at your personal responsibility. We wish to inform you that you may require permission from state authorities to export, re-export or import the product.

### 1.4.6 Registered Trademarks

Windows® XP and Windows® 7 are registered trademarks of the Microsoft Corporation.

## 1.5 Licenses

A license is required when using QViS Runtime, which depending on the hardware and the operating system used is either available on the existing system (e.g., Security Memory), or must be separately obtained.


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# 2 QViS Brief Overview

QViS is visualization software. QViS is comprised of two components:

- QViS, the development tool, executable on Windows PCs
- QViSRT, the runtime system, executable on a target device (HMI)

With the QViS development tool, images are compiled on the PC and linked with variables. The QViSRT runtime system displays theses images on the target device and provides the variables with values.

Overview:

| | | |
|---|---|---|
| 1st step: | | Create a project on a PC with QViS |
| 2nd step: | Build & Download | Build the project and transmit it to the target device |
| 3rd step: | | Project now runs on a target device and QViSRT |

## 2.1 Installing QViS

To install QViS, the QViS setup (e.g., Setup_QViS_V3.1.1.2.exe) must be executed and the instructions followed.

During setup, it is first checked whether .NET Framework 3.5SP1 is installed. Should it not be, it is automatically installed before the QViS setup is continued.

QViS is installed in the selected installation directory. In addition, examples of a QViS project and text management in Excel are installed in the directory "My Documents\QViS Projects."

- Example: "My Documents\QViS Projects\Example1_320x240"
- Text management in Excel: " My Documents\QViS Projects\QViS-Texts.xls"


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## 2.2 Launching QViS

QViS can be launched via the following options:

- Via a link on the Desktop, or
- Via an entry in the Start Menu, e.g., under "Start/Program/Hilscher/QViS V3.1.1/QViS"
- Via the command line "<Installationspfad>\QViS.exe"

If QViS is prompted by means of the command line, a specific project can be launched via parameter values.

The following parameter values to QViS.exe are possible:

| Name | Description | Example |
|---|---|---|
| -project= | QViS should open a specific project following Start. | QViS.exe "-project=c:\temp\MyProject.qpr" |


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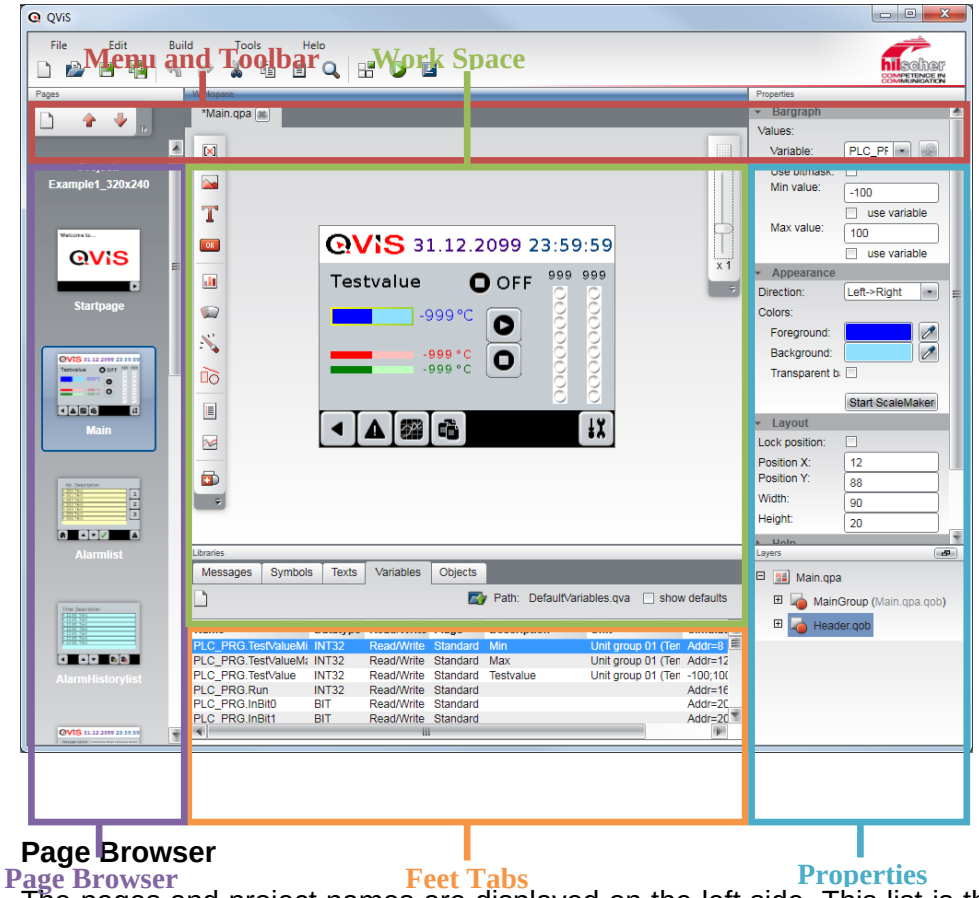
## 2.3 Layout and Areas of QViS




### Page Browser

The pages and project names are displayed on the left side. This list is the Page Browser.

### Work Space

Graphic editors are opened in the Work Space to, e.g., edit a page. These editors can either be the Page Editor or the Object Editor.

### Feet Tabs

There are several tabs in the lower area. These are called Feet Tabs. In the Feet Tab "Messages," diverse messages are listed. The remaining Feet Tabs are a browser and editors for symbols, texts, variables and objects.

### Properties

The properties of a selected element are displayed in the right area, and they can also be changed here.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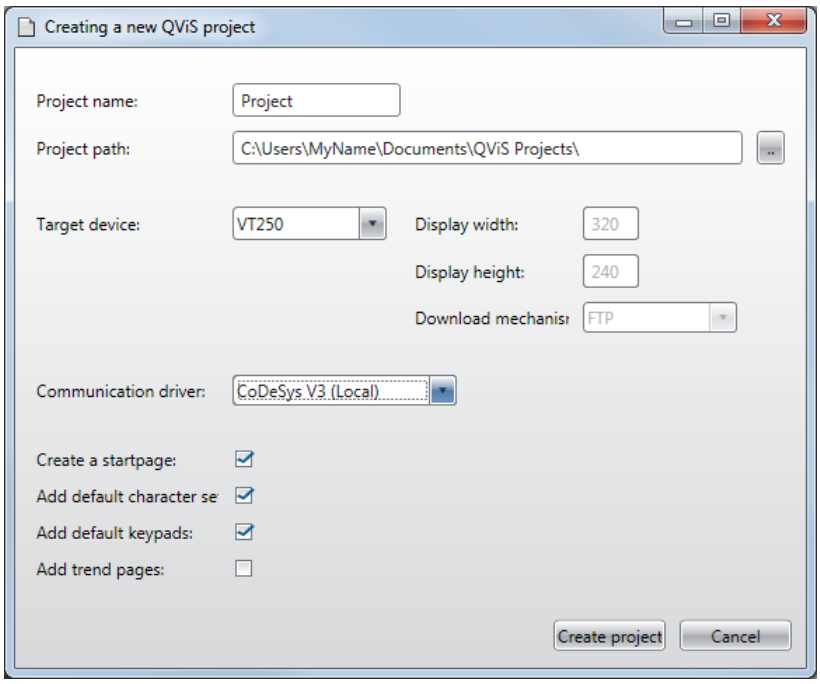
# 3 Creating a Project with QViS

## 3.1 The Project Creation Assistant

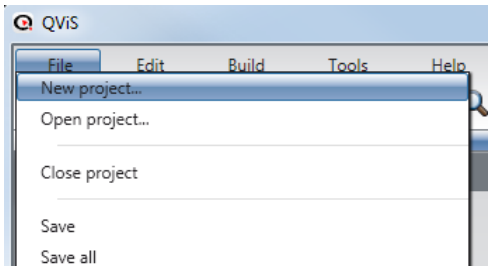
### 3.1.1 What Is the Project Creation Assistant?

The Project Creation Assistant helps the user in creating a new QViS project.




### 3.1.2 How Does the Project Creation Assistant Function?

The Project Creation Assistant can be launched by selecting "File" > "New project…" in the menu:





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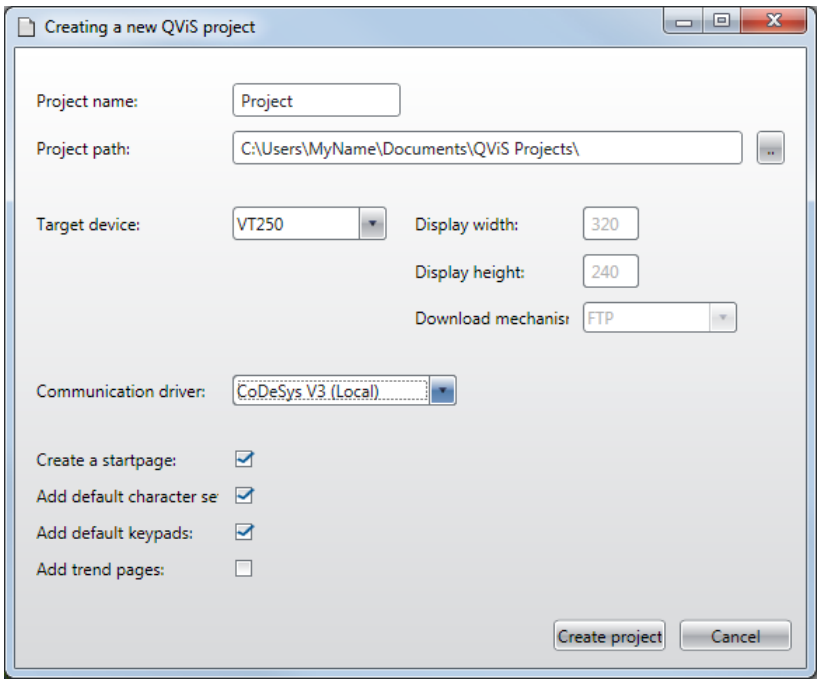


The following settings are possible:

**Project name:**

Name of the QViS project to be created. The project is created in a folder that likewise bears this name.

**Project path:**

Path where the project to be created is to be stored. In this path, a sub-file bearing the project name is created. All files and folders belonging to the project are saved in this sub-file.

**Target device:**

Select the target system on which the QViS project to be created is to run. Only installed target systems, as well as a freely programmable device named "User defined," are available for selection.

**Display width:**

The horizontal resolution of the target device's display in pixel.

**Display height:**

The vertical resolution of the target device's display in pixel.

**Download mechanism:**

The preferred download mechanism for copying the created project to the target device.

**Communication driver:**

The communication driver that QViS Runtime is to use. This can be, e.g., a communication driver that can communicate with an PLC. The communication driver is the link between QViS Runtime and the data to be displayed or written.


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**Create a start page:**

If this checkbox is selected, after creating the new project, an empty start page is generated, which is added to the project and it is also immediately opened in the Editor.

**Add default character sets:**

If this checkbox is selected, after creating the new project, the standard QViS default character sets are added to the project.

**Add default keypads:**

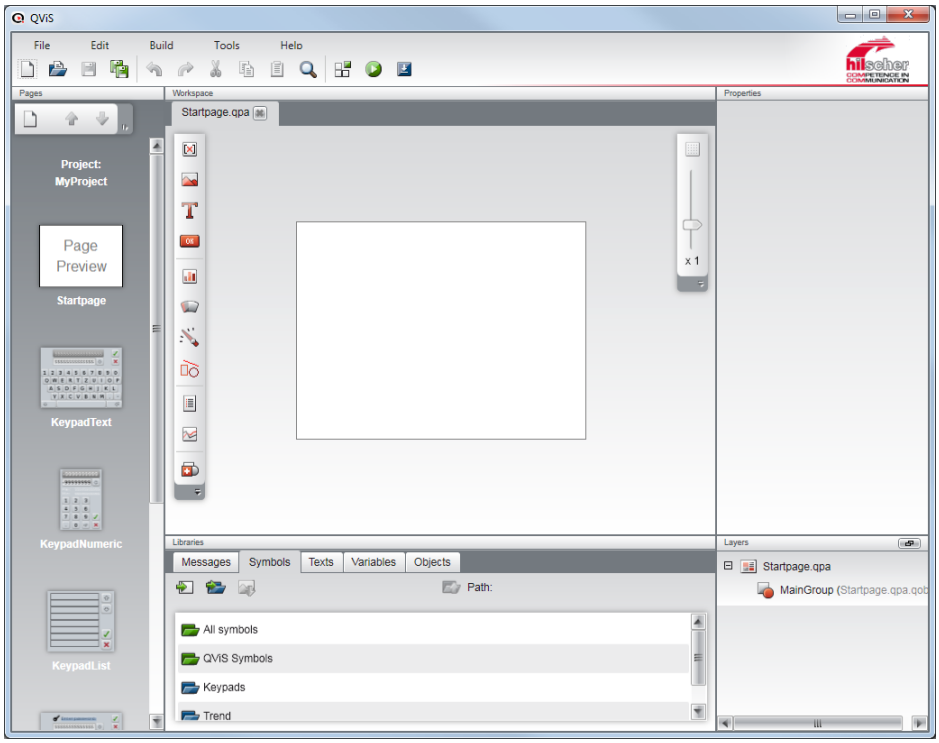
If this checkbox is selected, after creating the new project, the standard QViS default keypads, such as e.g., a numeric keypad, are added to the project.

**Add trend pages:**

If this checkbox is selected, after creating the new project, a page with a trend and a trend configuration page are added to the project.

Should you not see the setting "Add trend pages," then Trend has been deactivated.

After clicking the button "Create project" a QViS project is created:





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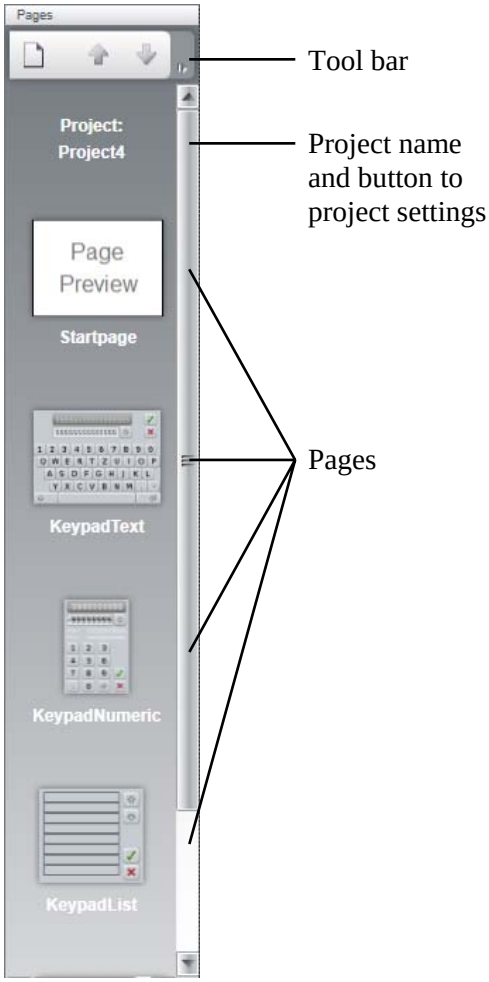
# 3.2 The Page Browser

## 3.2.1 What Is the Page Browser?

The Page Browser is located on the left side of the QViS main window. The Page Browser lists all pages of the opened QViS project.




The Page Browser offers the following options:

- Create a new page
- Remove pages in the project
- Rename pages
- Open pages for editing
- Display the project name
- Open the project properties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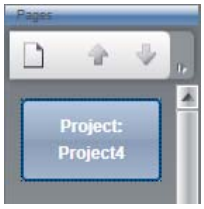
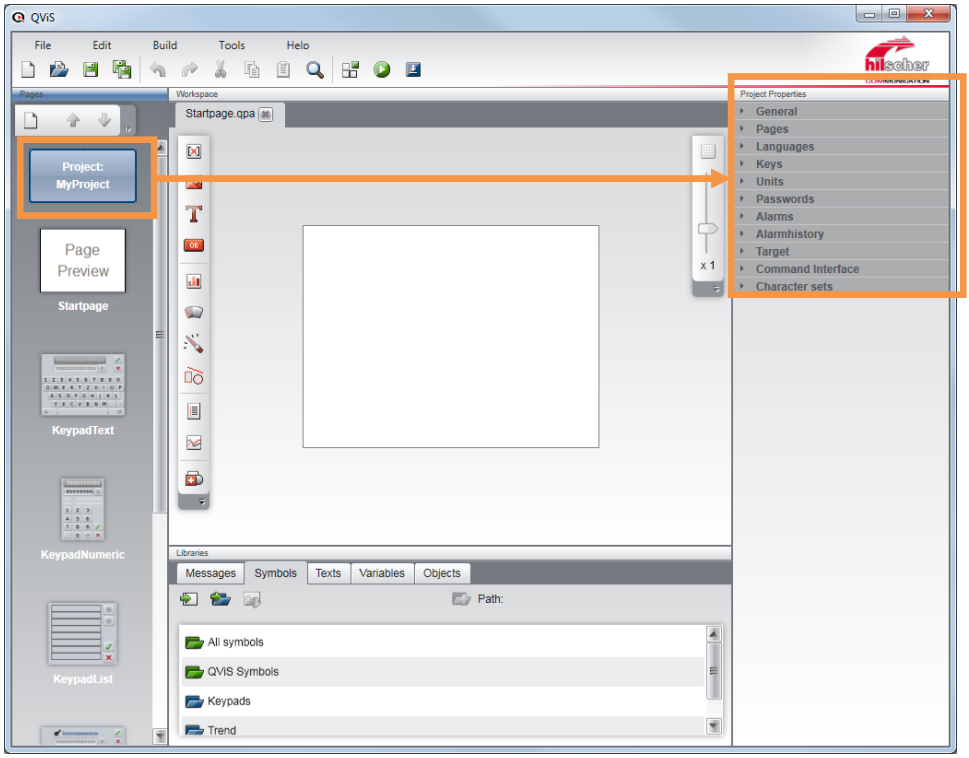
### 3.2.2 How Does the Page Browser Function?

In the Page Browser, you see a list with numerous entries. The first entry is always the project name:

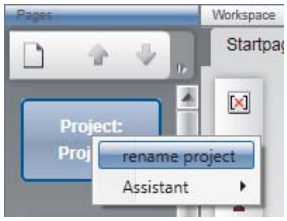



When the project name is selected, the project properties are opened in the area "Properties":




The project properties are described in the Chapter "Project Settings."

You can change the project name by either selecting the project name and then pressing the F2 key, or via a right click on the project name and then selecting "rename project" in the context menu.





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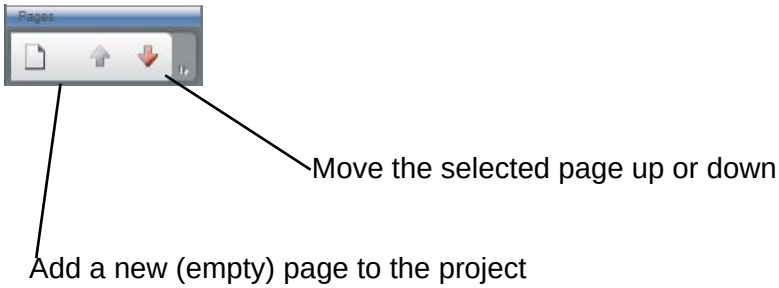
All further entries are QViS pages. An entry is displayed in this list for each page in the QViS project:

By double clicking onto a page, the page is opened with the PageEditor.

The following context menu is displayed by right clicking onto a page:

- Context menu "delete page" or "remove page":
  Delete/Remove the selected page from the QViS project.
- Context menu "rename page" or the "F2" key:
  Rename the selected page.
- Context menu "move up/down/to top/to bottom":
  Move the selected page within the Page Browser.

The toolbar above the list offers the following functions:





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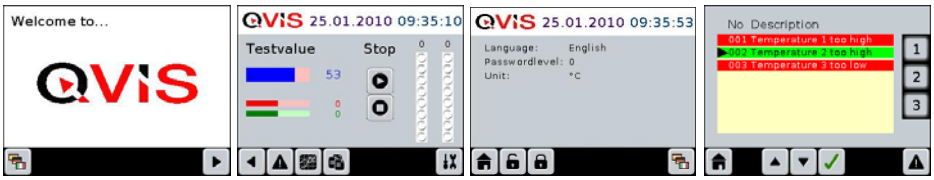
# 3.3 The Page Editor

## 3.3.1 What Is a Page?

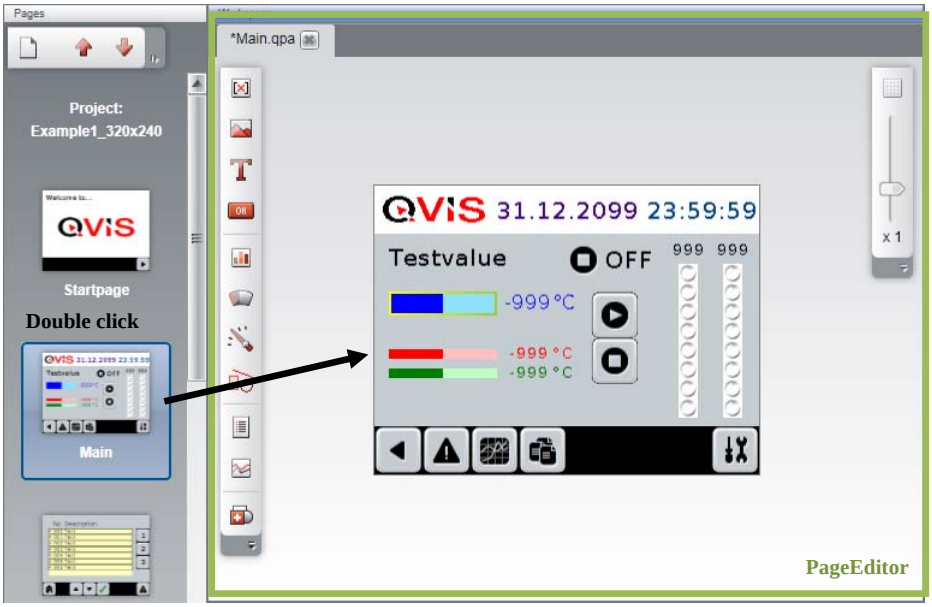
A page is a collection of different display elements. The user can display the various pages during runtime.

Overlay pages can also be generated, which can then be opened via a page (e.g., keypad, input window, amongst others).

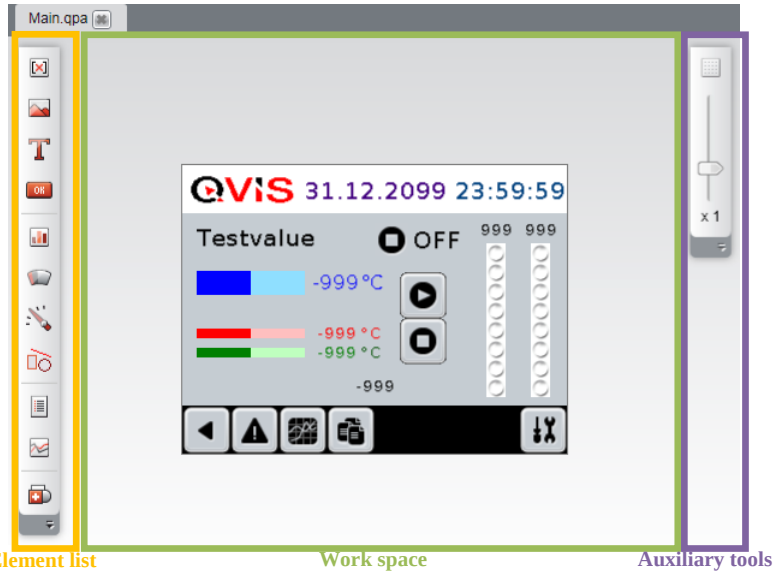
Pages:




A page is created and edited with the Page Editor. The Page Editor is opened by double clicking onto a page in the Page Browser:




The Page Editor is comprised of the following three areas:





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## 3.3.2 How to Operate It

In the Page Editor, the individual page elements are displayed. An element is selected via a mouse click. The properties of the element selected are displayed in the Properties area and can also be changed here.

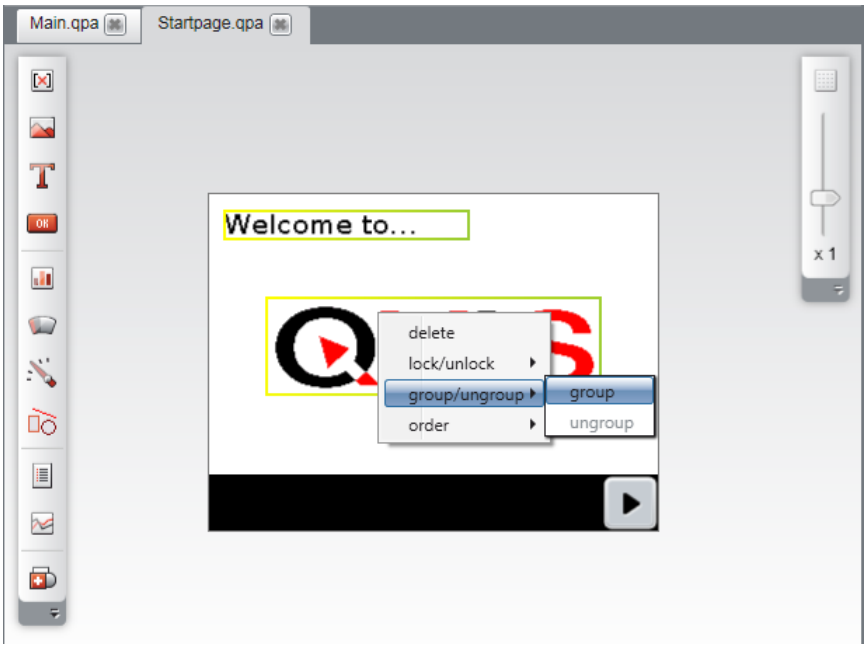
New elements are added by selecting the respective element from the Element List and positioning it on the page (Work space).

The zoom level of the view can be set in the area Auxiliary tools. Furthermore, you can either activate the auxiliary tool "grid" or configure it via a right click.

### 3.3.2.1 Grouping Elements

A group can be created from several elements. All elements in a group are moved together. To either move or edit an individual element within a group, you must first ungroup the group.

Select the elements that you wish to group, or choose the group that you wish to ungroup. With the right mouse key, click onto the work space and select "group" or "ungroup" in the context menu:





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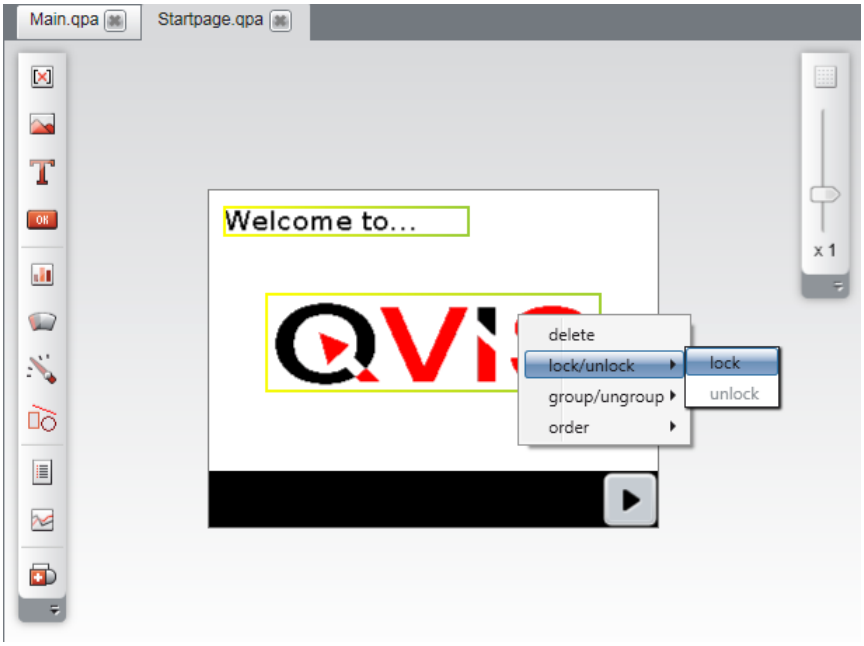
### 3.3.2.2 Locking Elements

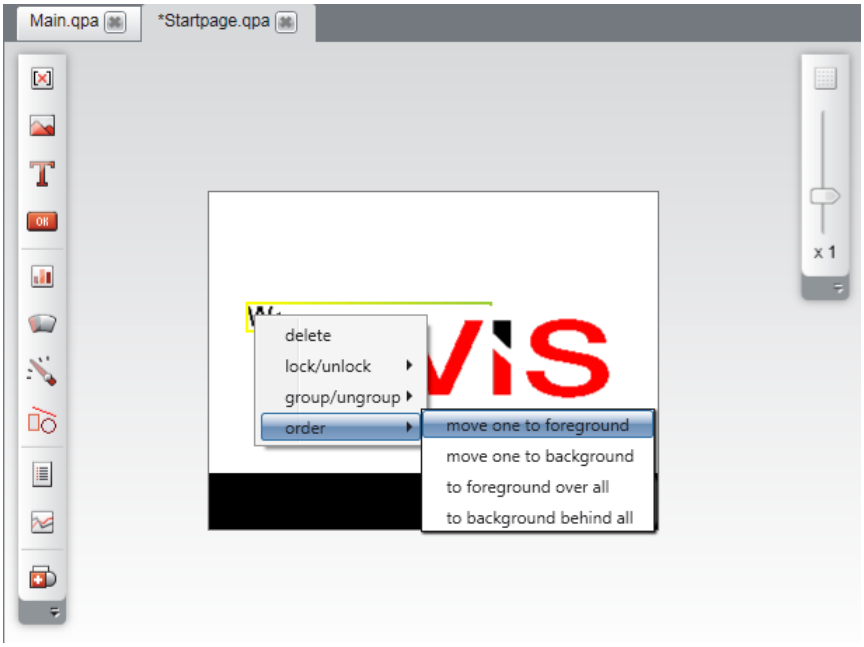
A element can be locked. You can no longer move a locked element..

Select one or more elements. With the right mouse key, click onto Work Space and select "lock" or "unlock" in the context menu:




### 3.3.2.3 Changing the Order of the Elements

The elements are drawn in the order they were created. It can thus happen that one element is drawn behind the other, even though this is not desired. To change the order, select the element and with the right mouse key, click onto the element and in the context menu, select:





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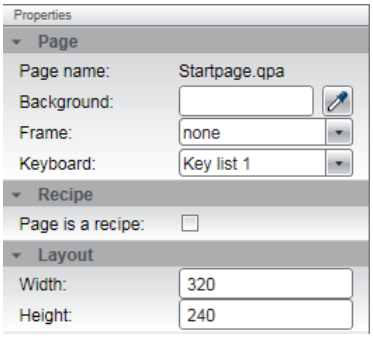
### 3.3.3 The Page Properties




Page name: file name of the page

Background: background color of the page

Frame: page frame

The page frame is only visible when a page is opened as an overlay (popup window) and the page in the background is larger than the overlay.

Keyboard: Here you set which "Key list" is valid on this page. In the Key list, functions for individual keys are defined (refer to 3.5.4)

Page is a recipe: Here it is determined whether the page is a recipe page, or not. If the answer is yes, then the parameters for recipe pages are displayed (refer to 4.9).

Default path*: Here you can enter a path where the recipe files are to be saved. If the field remains empty, the recipes are saved in the root directory for recipes, which is predefined in the configuration file QViSRT.cfg.

**Note:**

The specifications for the "Default path" are added to the preconfigured path with the key name "RecipeDefaultDir=" in the QViSRT.cfg of your QViS Runtime system.

Thus, only relative paths can be entered.

Use recipe group*: If the recipe files are to be saved in groups, this must be checked in the Checkbox. Groups are sub-files (e.g., "LightChocolate," "DarkChocolate") in the file system.

Auto save*: When the option "Auto save" has been selected, each change of a setpoint value (Read/Write variable) is automatically saved in the recipe file. It is not necessary to initiate storage via the "recipe save" function.

Auto upload*: When the option "Auto upload" is used, an upload (i.e., the control loads the values of the Read/Write variables) is automatically executed. It is not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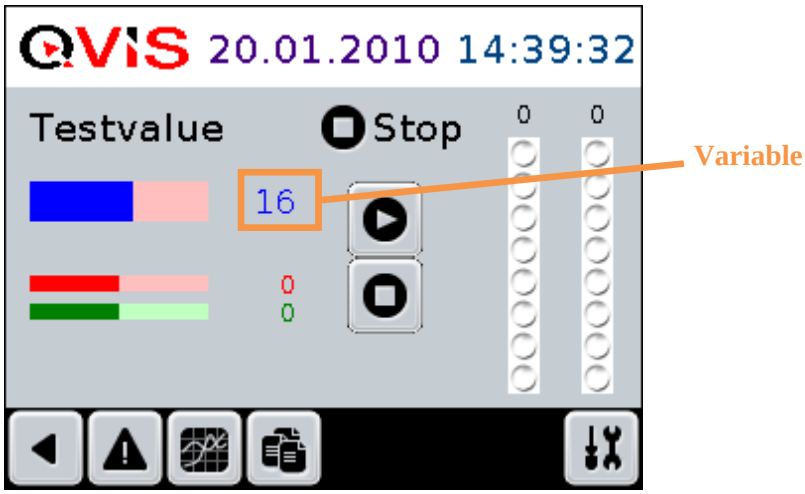
| | |
|---|---|
| | necessary to initiate an upload via the "recipe upload" function. |
| Save recipe name*: | If a recipe download is performed, Type String saves the name of this recipe in the variables that have been set.. |
| Save recipe group*: | If a recipe download is performed, Type String stores the group of this recipe in the variables that have been set. |
| Width: | Page width in pixel |
| Height: | Page height in pixel |

## 3.3.4 Element Variable

### 3.3.4.1 What Is the Element Variable?

The element "Variable" is used to display a variable value. It is either displayed as a numeric value or as text (depending on the data type of the variable).




### 3.3.4.2 How Do You Insert an Element Variable into QViS?

Open a page in PageEditor. In the Element List, click onto the element "Variable":

Subsequently, you click onto the position in the page where you wish to place the element: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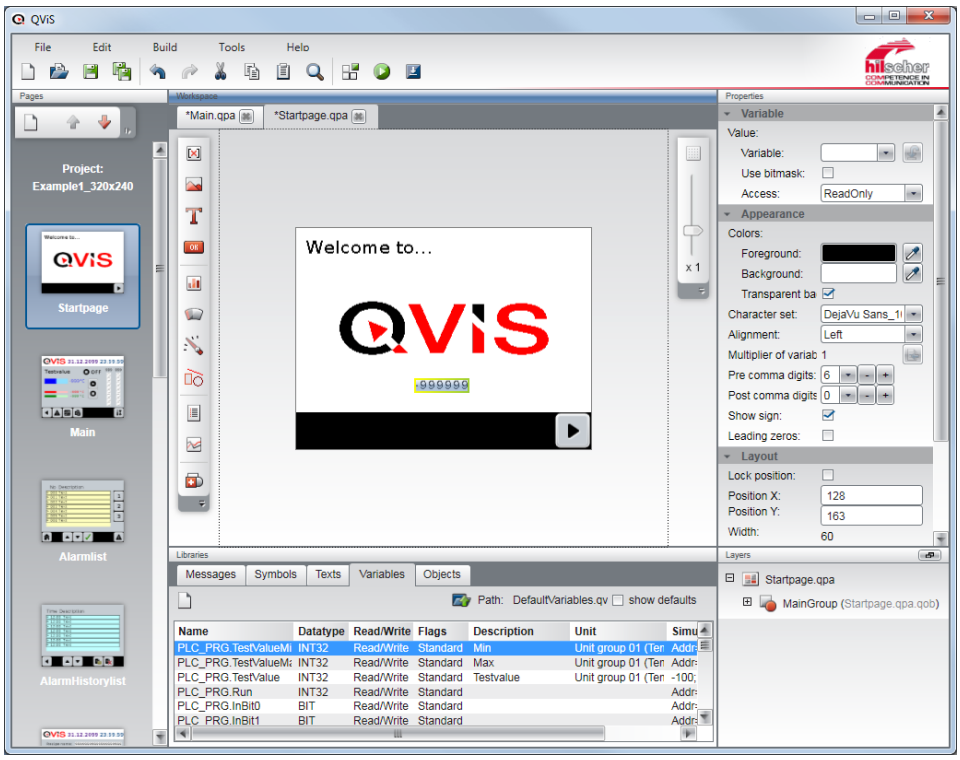
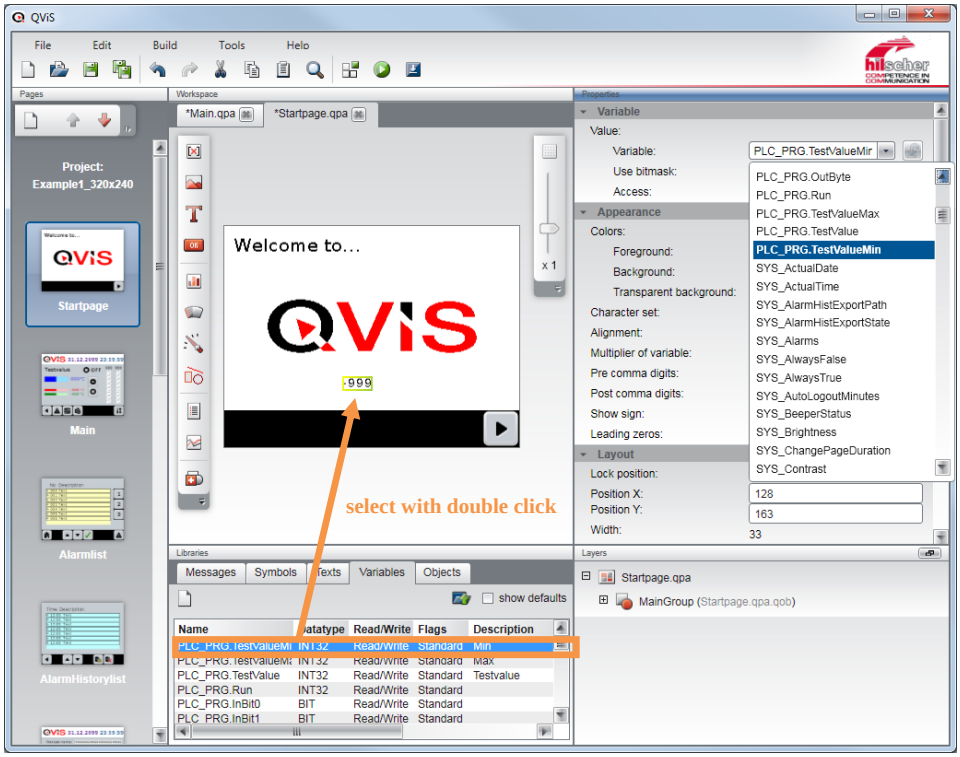



Select the element in the page. The element's properties are displayed in the Properties area. You now either choose the desired value for the property "Variable," or double click onto the desired variable in the Feet Tab:





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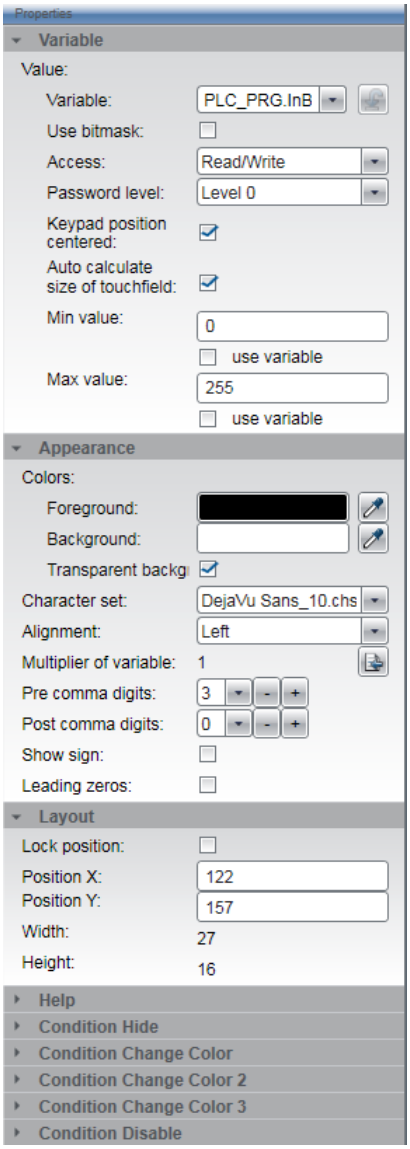
### 3.3.4.3 Properties of the Element Variable




| | |
|---|---|
| Variable: | Variable, with which the element is linked. |
| Use bitmask: | With a bitmask, only individual bits of the variable are taken into consideration. If a bitmask is used, the resulting value in QViSRT is always 1 or 0. Bitmask is only displayed when the selected variable is an integral data type other than BOOL. |
| Access: | If you have set "Read/Write," the window is opened when you click onto (or touch) the variable value in order to allocate a new value to the variable. If the linked variable is a STRING data type, the alphanumeric keypad is opened, otherwise the numeric one. When "ReadOnly" is set, nothing happens when you click onto the variable value. |
| Password Level: | The Password Level is defined here. The window for allocating a new value to the linked variable only opens when the current User Level is greater than or equal to the set Password Level. |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Keypad position centered:
If this option has been selected, the window for allocating a new value to the linked variable, the so-called Keypad, is opened centered to the QViS window.

Keypad position X: Horizontal position of the Keypad in pixel

Keypad position Y: Vertical position of the Keypad in pixel

Auto calculate size of touchfield:
If this option has been selected, the size of the touchfield for editing the variable is automatically assigned.

Width of touchfield: Width of touchfield

Height of touchfield: Height of touchfield

Alignment: Alignment of the character in the touchfield

Min value: The window for allocating a new value to the variable will not permit values lower than the limit set here. The limit can be a fixed value or a variable.

Max value: The window for allocating a new value to the variable will not permit values higher than the limit set here. The limit can be a fixed value or a variable.

Foreground: text color

Background: background color of the text

Transparent background:
If this option is selected, no background is drawn.

Character set: The Character Set (font) set here is used in the display format for the variable value.

Alignment: Horizontal text alignment

Time format: In the case of a variable type "TIME," you can select the display format (e.g., hh:mm).

Date format: In the case of a variable type "DATE," you can select the display format (e.g., dd.mm.yy).

String length: In the case of a variable type "STRING," the length to be displayed can be specified here.

Multiplier of variable: For some variable types, a factor can be specified by which the actual value is multiplied prior to display. Attention: Currently, only factors <1 are possible.

Pre decimal digits: For some variable types, the maximum number of pre decimal digits can be specified.

Post decimal digits: For some variable types, the maximum number of post decimal digits can be specified.

Show sign: For some variable types, this option is selectable to display the sign (-) in negative numbers.


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| | |
|---|---|
| Show leading zeros: | For some variable types, this option is selectable to fill in the unneeded pre decimal digits with leading zeros. |
| Lock Position: | If this option is selected, this element can no longer be moved. This option can either be deactivated/activated here, or via the context menu of the element in Work Space. |
| Position X: | Horizontal position of the element in pixel. The value is relative to the page (or to the object) where the element has been added. The value 0 is the left margin (or object margin). |
| Position Y: | Vertical position of the element in pixel. The value is relative to the page (or to the object) where the element has been added. The value 0 is the upper margin (or object margin). |
| Width: | Element width in pixel. The size ensues from the Character Set and format selected. |
| Height: | Element height in pixel. The size ensues from the Character Set. |
| Help number: | Help number for this element |
| Condition Hide: | You can define a condition here. If the condition is applicable, the element is hidden. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=) |
| Condition Change Color: | You can define a condition here. If the condition is applicable, the element will be displayed in another color. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=) |
| Condition Change Color 2: | You can define a condition here. If the condition is applicable, the element will be displayed in another color. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=) |
| Condition Change Color 3: | You can define a condition here. If the condition is applicable, the element will be displayed in another color. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=) |
| Condition Disable: | You can define a condition here. If the condition is applicable, you can no longer edit the element by clicking onto it. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=) |


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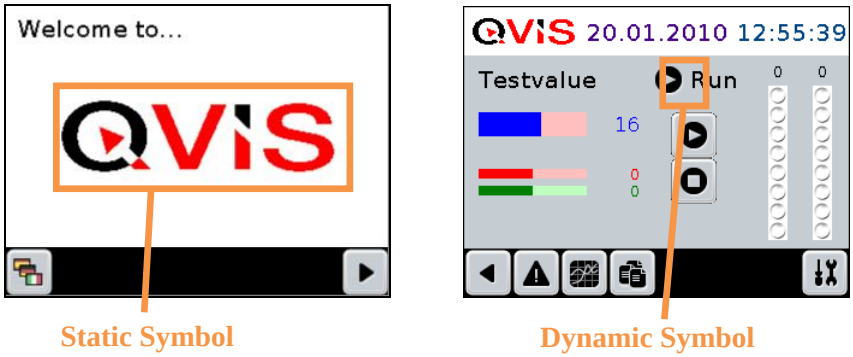
## 3.3.5 Element Symbol

### 3.3.5.1 What Is the Element Symbol?

In the simplest case, it is the symbol for a specific image (image file). During runtime, precisely this symbol is displayed. We are referring to a static symbol.

The element "Symbol" can also be linked to a variable. The symbol then displayed can change during runtime. Which symbol is displayed depends on the value of the variable. You can define areas with a corresponding symbol. If the value of the variable falls within a certain range, the corresponding symbol is displayed. We are then referring to a dynamic symbol.

Example: You wish to display the status of a machine as a symbol. When the machine is running, a triangle is to be displayed, otherwise a rectangle. For this purpose, a dynamic symbol is used. This symbol is linked to a variable, which reflects the machine status: 1 = Run, 0 = Stop. Depending on the variable value, the symbol displayed is either a "triangle" or a "rectangle."




### 3.3.5.2 How Do You Insert an Element Symbol into QViS?

**Step 1: Inserting an element**

Open a page in Page Editor. In the Element List, click onto the element "Symbol":

Subsequently click onto the position in the page where you wish to place the element: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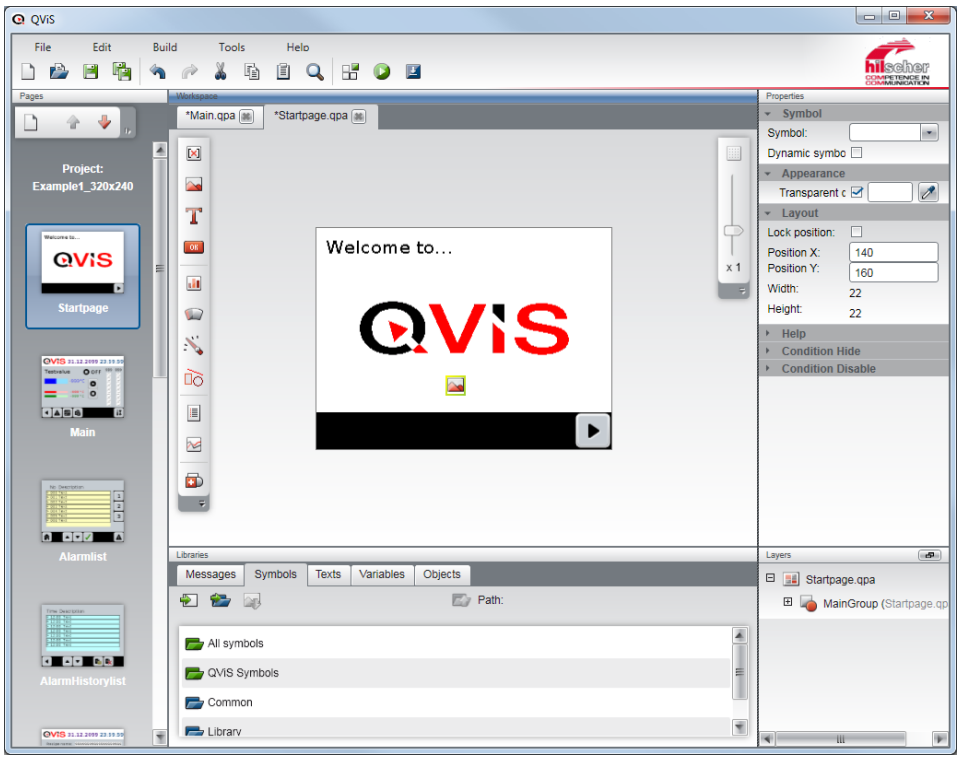
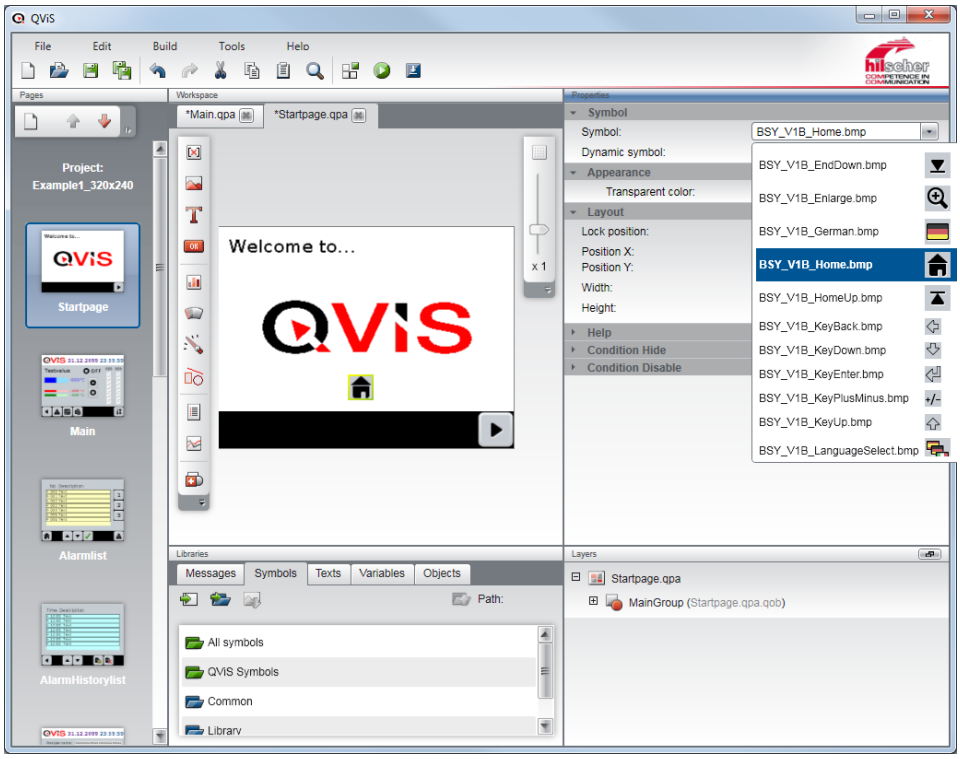



### Step 2: Allocating a symbol

There are two options for allocating a symbol to the element:

### Step 2a Select the symbol in Properties

Select the element in the page. The element's properties are displayed in the Properties area. Choose the desired image file for the Property "Symbol":





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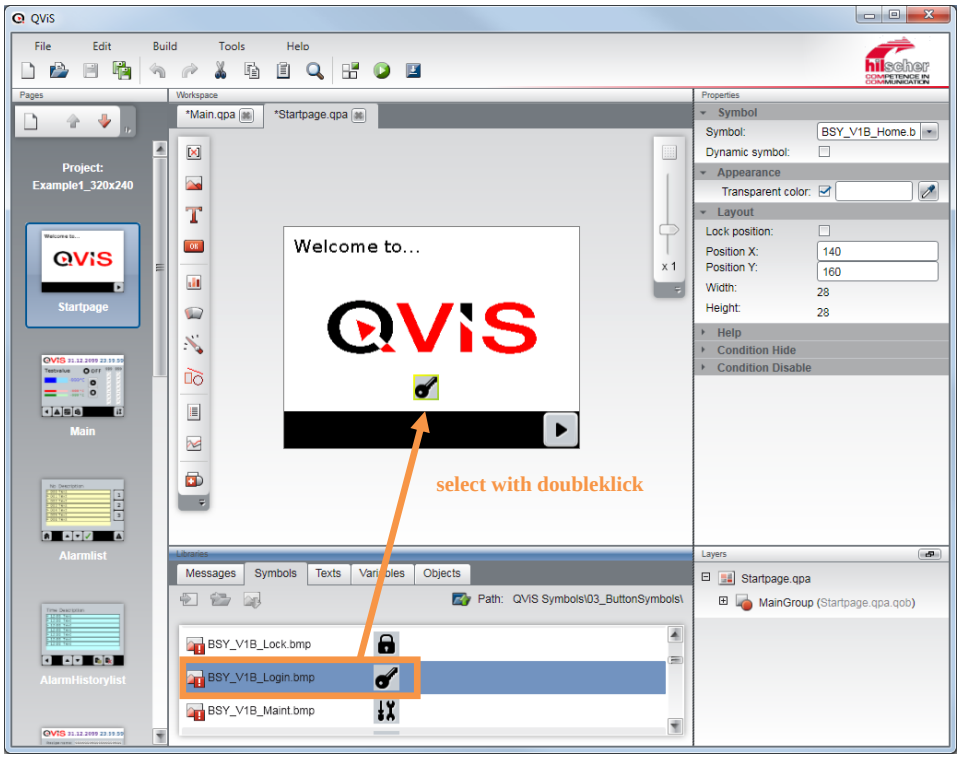
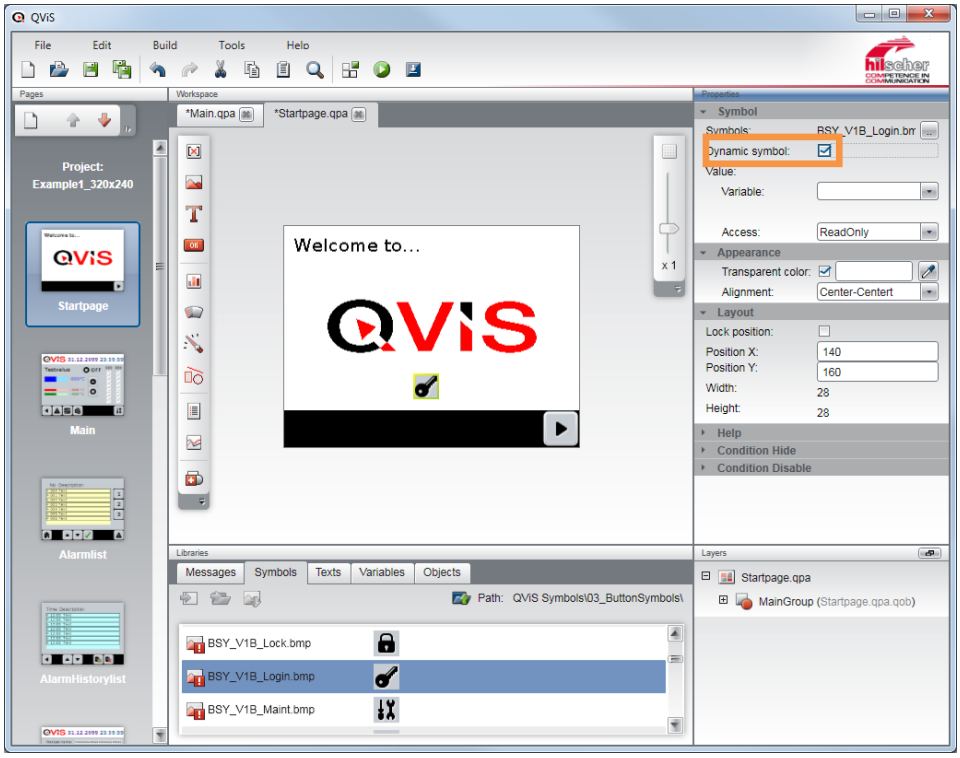
### Step 2b: Select the symbol in the Feet Tab

Select the element in the page and double click onto the desired symbol in Feet Tab Symbols.




### Step 3 (optional): Using a dynamic symbol

To use a dynamic symbol, you simply activate the property "Dynamic symbol" in an existing symbol





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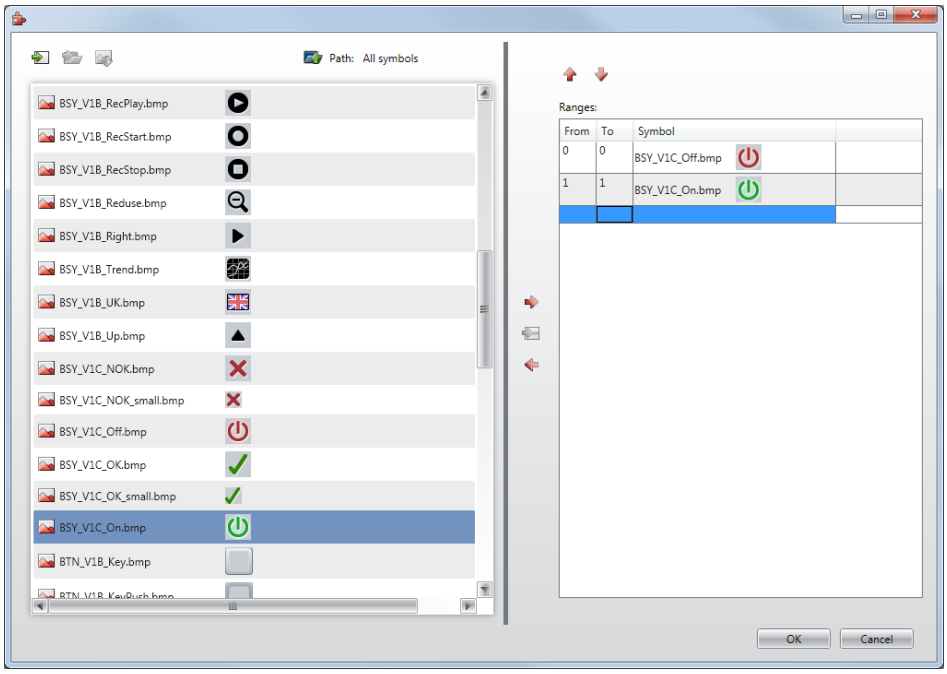
To define the areas with the corresponding symbols, click onto the button ".." at Symbols. The following window opens:




In the left-hand table, you will see the symbols available for the respective project. When you double click onto a symbol, it is added to the table on the right. This symbol can be allocated to a value range. If the linked variable has a value that lies within this range, the symbol will be displayed.

When all symbols, incl. the value range, have been defined, the window can be closed via the "OK" button.

**Note:**

The lower value for displaying this symbol is indicated in the column "From," the higher one in "To."

The value range is valid, including the values indicated in the From/To columns.

In the case of Boolean variables, you must enter the values 0/0 in From/To for the symbol in FALSE and 1/1 for the symbol in TRUE.

**Note:**

For non-Boolean variables, you can define an arbitrary number of symbols/value ranges.

### Step 3.1: Linking an element to a variable

There are two options for linking an element to a variable.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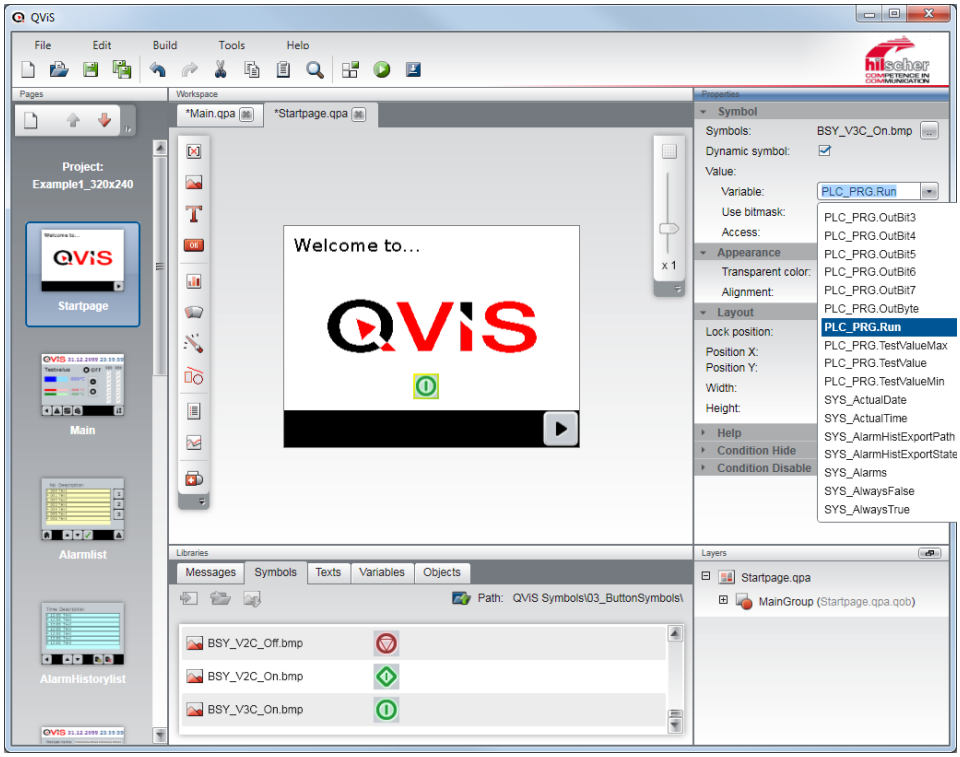
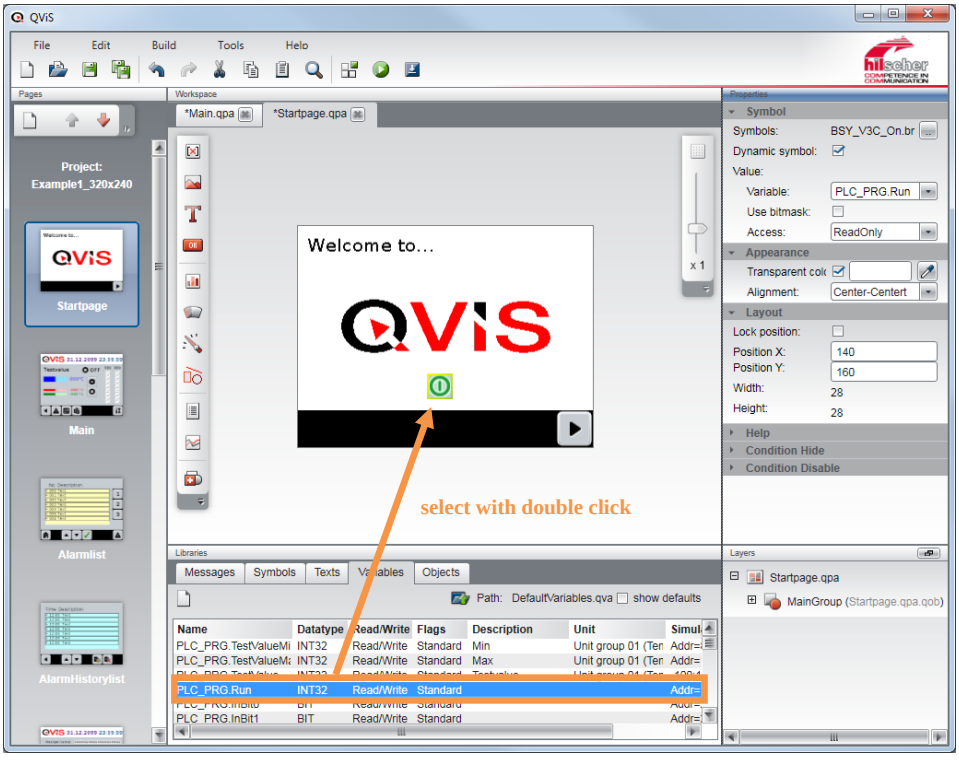
### Step 3.1a: Select a variable in Properties

Select the element in the page. The element's properties are displayed in the Properties area. Choose the desired variable for the Property "Variable," with which this element is to be linked:




### Step 3.1b: Select the variable in the Feet Tab

Select the element in the page and double click onto the desired variable in Feet Tab Variable.





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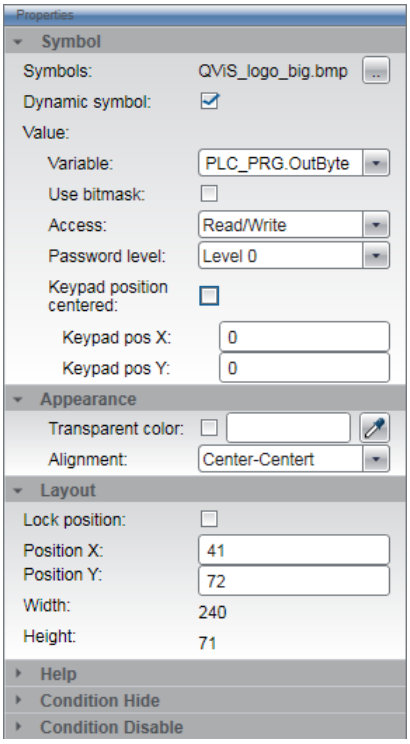
### 3.3.5.3 Properties of the Element Symbol




Symbol: File name of the symbol to be displayed

Symbols: List of symbol names and the correspondent value range. The list can be changed by pressing the ".." button.

Start ScaleMaker: If symbols are used that were generated with the ScaleMaker, to launch it, a further button, "Open with ScaleMaker," is displayed. The ScaleMaker is described in the chapter "Element Pointer Instrument."

Dynamic symbol: If "Dynamic symbol" is not activated, a certain symbol is displayed. This symbol does not change during runtime. Thus, this symbol is static.

If the "Dynamic symbol" is activated, the symbol must be linked to a variable. During runtime another symbol is displayed, depending on the value of this variable. The parameters marked with * are only displayed for dynamic symbols.

Variable*: Variable to which the element is linked.

Use bitmask*: With a bitmask, only the individual bits of the variable are taken into consideration. If a bitmask is used, the resulting value in QViSRT is always 1 or 0.

Bitmask is only displayed when the data type is an integral data type other than BOOL.

Access*: If you have set "Read/Write," the window is opened when you click onto (or touch) the symbol in order to add a new symbol, and thus write the linked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variable. When "ReadOnly" is set, nothing happens when you click onto the symbol.

Password Level*: The Password Level is defined here. The window for selecting a new symbol only opens when the current User Level is greater than or equal to the set Password Level.

Keypad position centered*: If this option has been selected, the window for selecting a new symbol is opened centered to the QViS window.

Keypad position X*: Horizontal position of the window in pixel for selecting a new symbol.

Keypad position Y*: Vertical position of the window in pixel for selecting a new symbol.

Transparent color: A "transparent color" can be defined here. The pixel with this color is not drawn.

Alignment: Here you define the horizontal and vertical alignment of the symbol within the element. If all symbols have the same size, this setting is ineffective.

Lock Position: If this option is selected, this element can no longer be moved. This option can either be deactivated/activated here, or via the context menu of the element in Work Space.

Position X: Horizontal position of the element in pixel. The value is relative to the page (or to the object) where the element has been inserted. The value 0 is the left margin (or object margin).

Position Y: Vertical position of the element in pixel. The value is relative to the page (or to the object) where the element has been inserted. The value 0 is the upper margin (or object margin).

Width: Element width in pixel. The size automatically ensues from the selected symbols.

Height: Element height in pixel. The size automatically ensues from the selected symbols.

Help number: Help number for this element

Condition Hide: You can define a condition here. If the condition is applicable, the element is hidden. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=)

Condition Disable: You can define a condition here. If the condition is applicable, you can no longer edit the element by clicking onto it. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=)


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## 3.3.6 Element Text

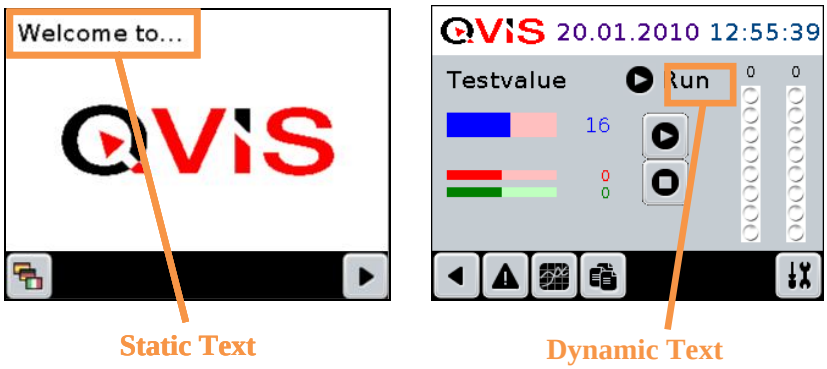
### 3.3.6.1 What Is the Element Text?

In the simplest case, it is just a text. During runtime, precisely this text is displayed. We are referring to a static text.

The element "Text" can also be linked to a variable. The text then displayed can change during runtime. Which text is displayed depends on the value of the variable. You can define areas with a corresponding text. We are then referring to a dynamic text.

**Example:**

You wish to display the status of a machine as a text. When the machine is running, "Run" is to be displayed, otherwise "Stop." For this purpose, an element Text is used. This element is linked to a variable, which reflects the machine status: 1 = Run, 0 = Stop. Depending on the variable value, the either the text "Run" or "Stop" is displayed.




### 3.3.6.2 How Do You Insert an Element Text into QViS?

**Step 1: Inserting an element**

Open a page in Page Editor. In the Element List, click onto the element "Text":

Subsequently click onto the position in the page where you wish to place the element: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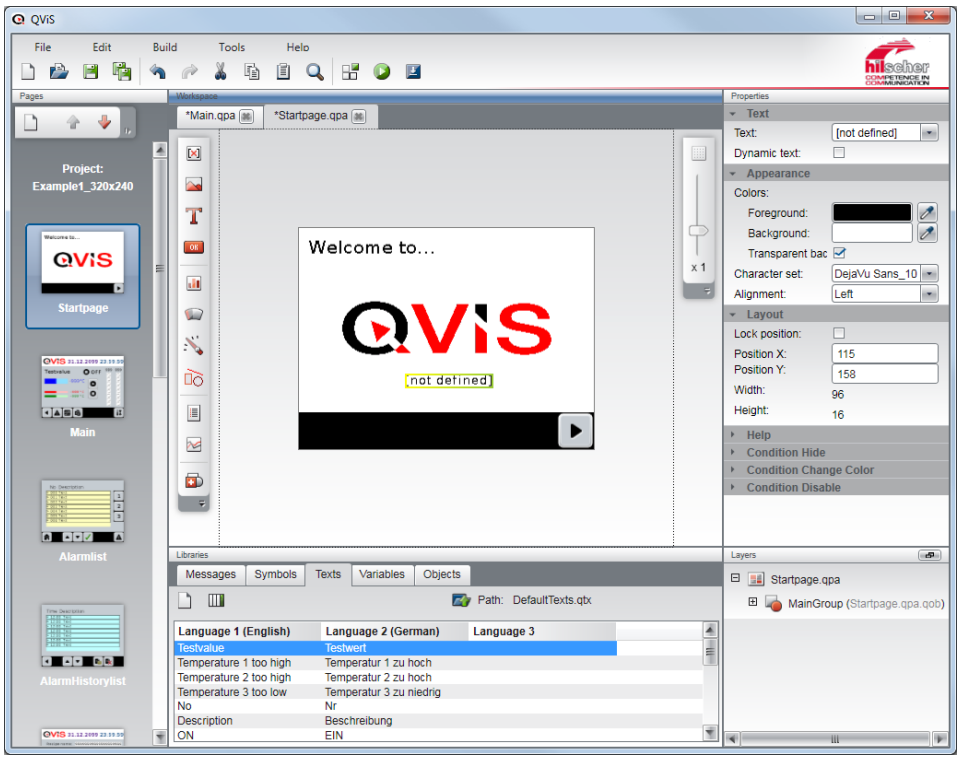
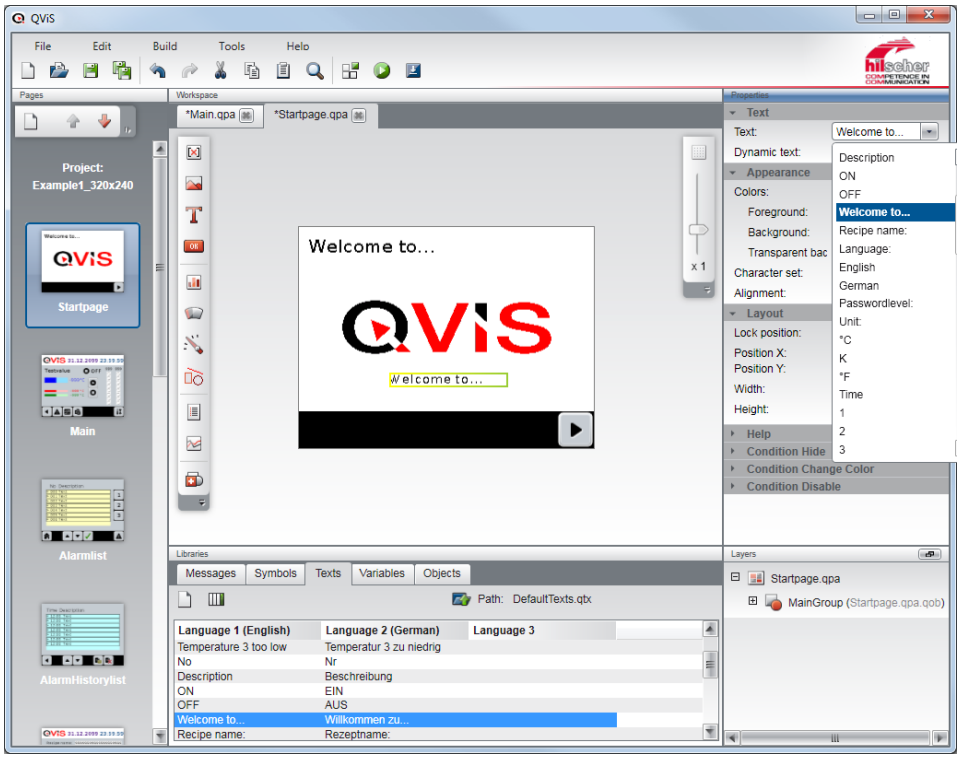



### Step 2: Allocating Text

There are two options for allocating a text to the element:

### Step 2a Select the text in Properties

Select the element in the page. The element's properties are displayed in the Properties area. Choose the desired text for the Property "Text":





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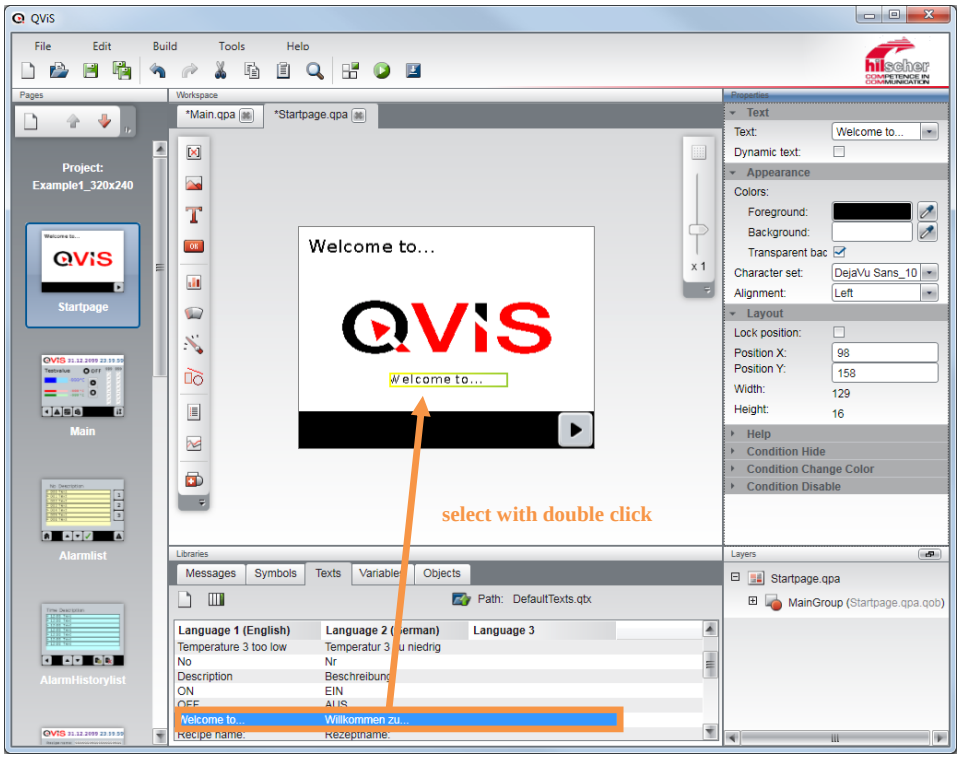
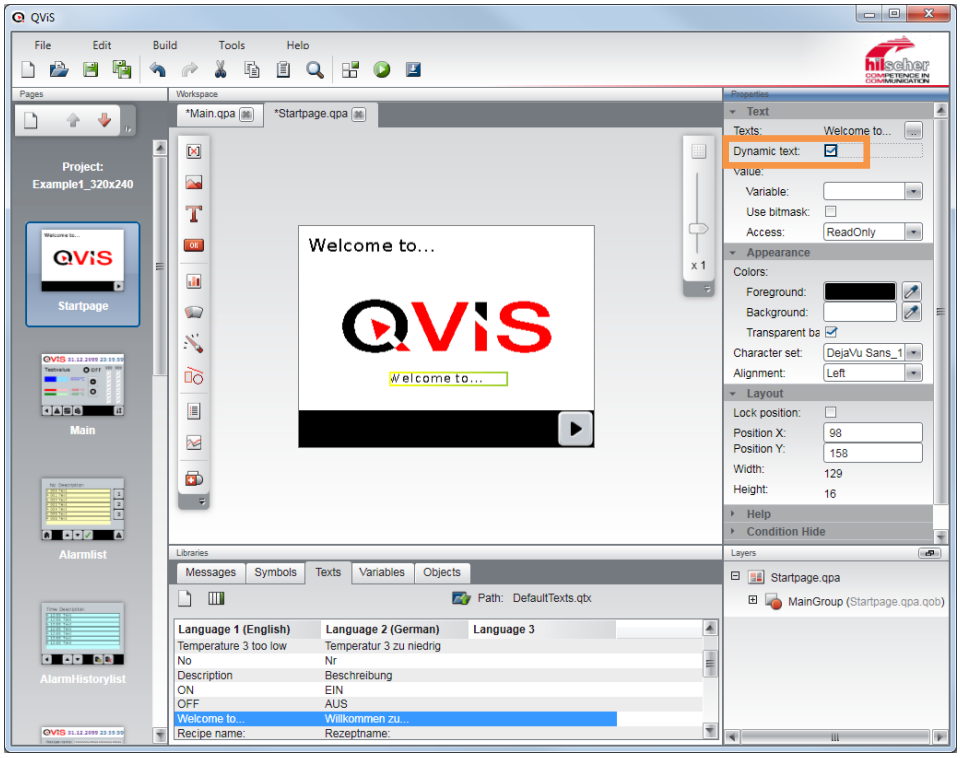
### Step 2b: Select the text in the Feet Tab

Select the element in the page and double click onto the desired text in Feet Tab Texts.




### Step 3 (optional): Using a dynamic text

To use a dynamic text, you simply activate the property "Dynamic text" in an existing text:





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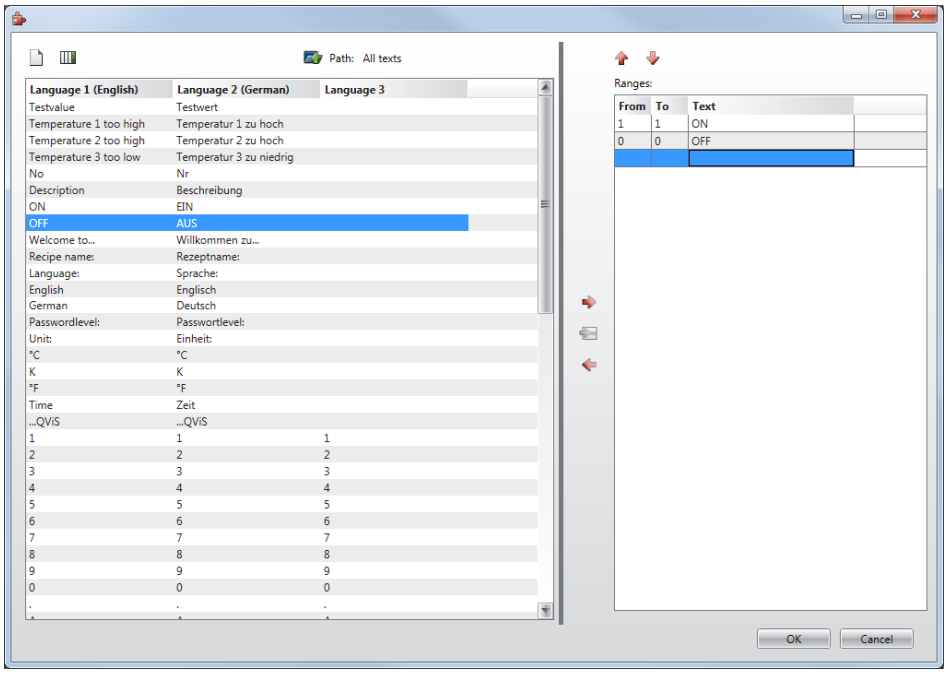
To define the areas with the corresponding texts, click onto the button ".." at Texts. The following window opens:




In the left-hand table, you will see the texts available for the respective project. When you double click onto a text, it is added to the table on the right. This text can be allocated to a value range. If the linked variable has a value that lies within this range, the text will be displayed.

When all texts, incl. the value range, have been defined, the window can be closed via the "OK" button.

**Note:**

The lower value for displaying this text is indicated in the column "From," the higher one in "To."

The value range is valid, including the values indicated in the From/To columns.

In the case of Boolean variables, you must enter the values 0/0 in From/To for the text in FALSE and 1/1 for the text in TRUE.

**Note:**

For non-Boolean variables, you can define an arbitrary number of symbols/value ranges.

### Step 3.1: Linking an element with a variable

There are two options for linking an element to a variable.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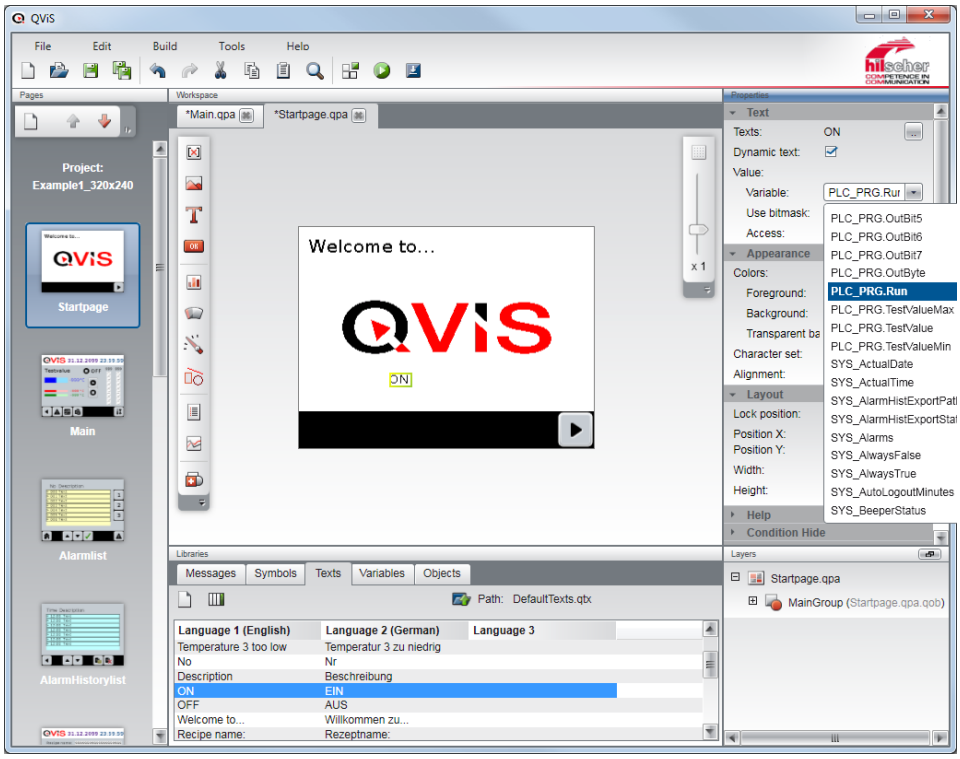
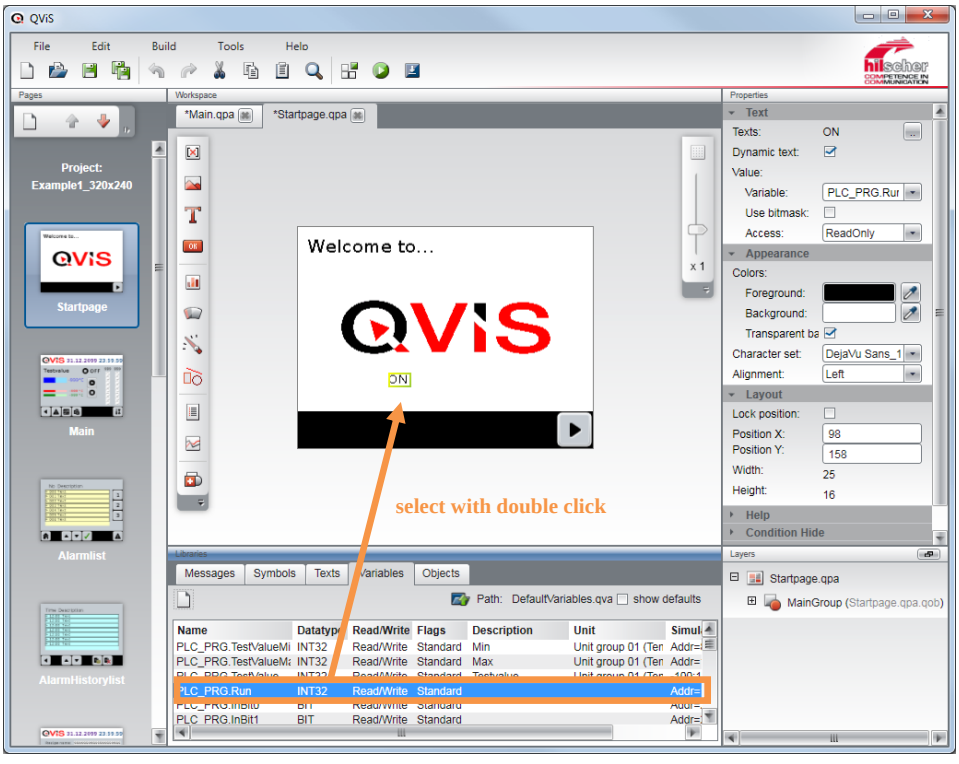
### Step 3.1a: Select a variable in Properties

Select the element in the page. The element's properties are displayed in the Properties area. Choose the desired variable for the Property "Variable," with which this element is to be linked:




### Step 3.1b: Select the variable in the Feet Tab

Select the element in the page and double click onto the desired variable in Feet Tab Variable.





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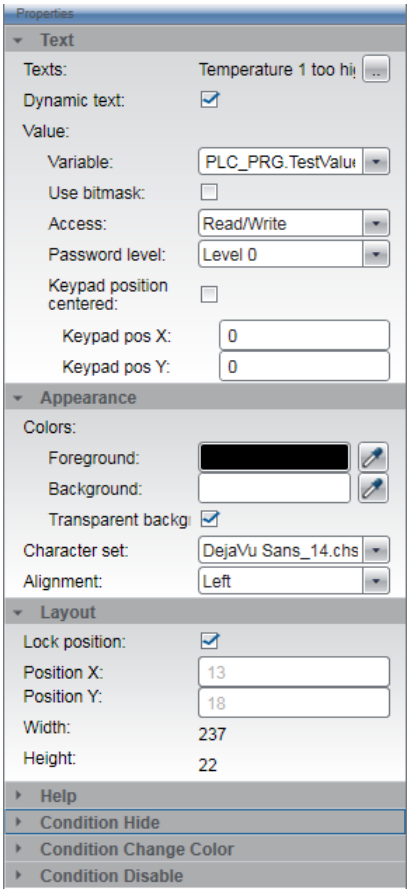
### 3.3.6.3 Properties of the Element Text




| | |
|---|---|
| Text: | The text to be displayed; the text is displayed in the language currently set for the project. |
| Texts: | List with the texts and the correspondent value range. The list can be changed by pressing the ".." button. |
| Dynamic text: | If "Dynamic text" is not activated, a certain text is displayed. This text does not change during runtime. Thus, this text is static.<br>If the "Dynamic text" is activated, the text must be linked to a variable. During runtime another text is displayed, depending on the value of this variable. The parameters marked with * are only displayed for dynamic text. |
| Variable*: | Variable to which the element is linked. |
| Use bitmask*: | With a bitmask, only the individual bits of the variable are taken into consideration. If a bitmask is used, the resulting value in QViSRT is always 1 or 0.<br>Bitmask is only displayed when the data type is an integral data type other than BOOL. |
| Access*: | If you have set "Read/Write," the window is opened when you click onto (or touch) the text in order to add a new text, and thus write the linked variable. |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When "ReadOnly" is set, nothing happens when you click onto the text.

Password Level*: The Password Level is defined here. The window for selecting a new text only opens when the current User Level is greater than or equal to the set Password Level.

Keypad position centered*:
If this option has been selected, the window for selecting a new text is opened centered to the QViS window.

Keypad position X*: Horizontal position of the window in pixel for selecting a new text.

Keypad position Y*: Vertical position of the window in pixel for selecting a new text.

Foreground: text color

Background: background color of the text

Transparent background:
If this option is selected, no background will be drawn.

Character set: The Character Set (font) set here is used for displaying the text.

Alignment: Horizontal text alignment in relation to the element width.

Lock Position: If this option is selected, this element can no longer be moved. This option can either be deactivated/activated here, or via the context menu of the element in Work Space.

Position X: Horizontal position of the element in pixel. The value is relative to the page (or to the object) where the element has been inserted. The value 0 is the left margin (or object margin).

Position Y: Vertical position of the element in pixel. The value is relative to the page (or to the object) where the element has been inserted. The value 0 is the upper margin (or object margin).

Width: Element width in pixel. The size automatically ensues from the selected Character Set and text length.

Height: Element height in pixel. The size automatically ensues from the selected Character Set and number of text lines.

Help number: Help number for this element

Condition Hide: You can define a condition here. If the condition is applicable, the element is hidden. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=).


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Condition Change Color:

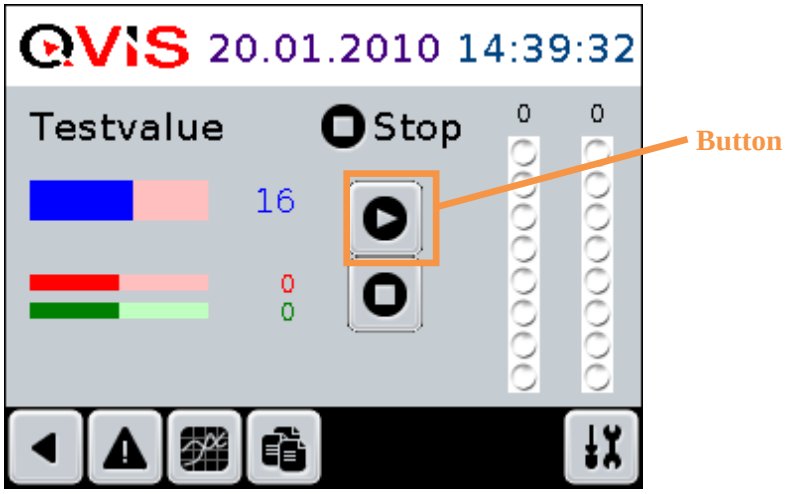
You can define a condition here. If the condition is applicable, the element is displayed in another color. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=).

Condition Disable: You can define a condition here. If the condition is applicable, you can no longer edit the element by clicking onto it. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=)

## 3.3.7 Element Button

### 3.3.7.1 What Is the Element Button?

The element "Button" is a key or switch that users can activate per mouse click or touch. This triggers a function.




### 3.3.7.2 How Do You Insert an Element Button into QViS?

**Step 1: Inserting an element**

Open a page in Page Editor. In the Element List, click onto the element "Button":

Subsequently click onto the position in the page where you wish to place the element: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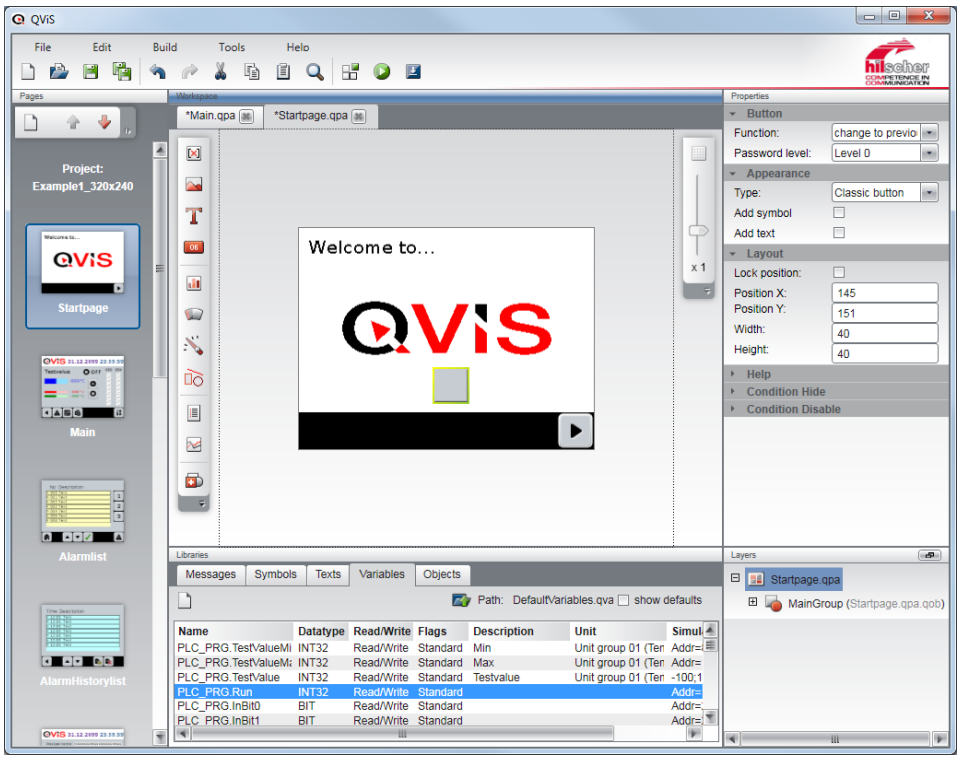
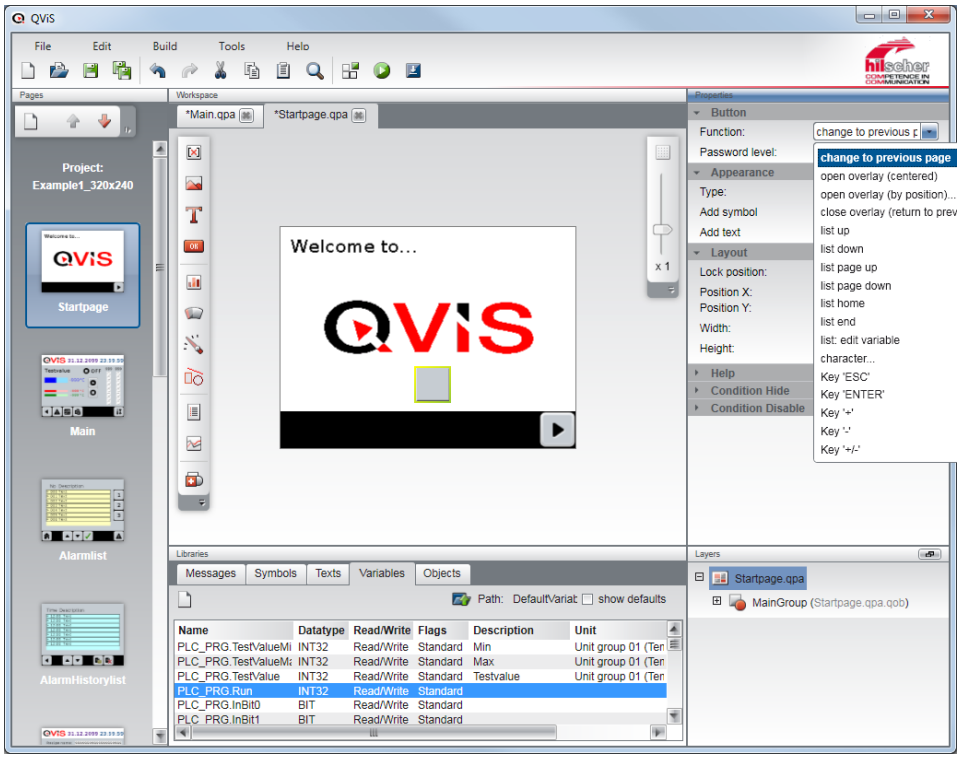



### Step 2: Selecting the function to be executed

Select the element in the page. The element's properties are displayed in the Properties area. Choose the desired button function for the Property "Function.":




For some functions, additional parameters must be defined. The function "change to page," e.g., an additional parameter must be defined for stipulating the target page to be changed to.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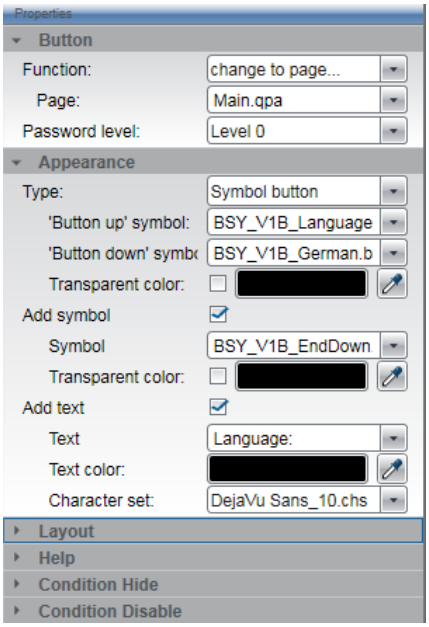
### 3.3.7.3 Properties of the Element Button




Function: Here you select the desired function for the button. Please take note that a given hardware does not necessarily support all functions.

Possible functions are:

"modify variable directly"
A variable can be directly modified via this function. The following buttons are available:

"set on pressed":
Sets the variable to a defined value when the key is pressed

"set on released":
Sets the variable to a defined value when the key is released

"set on pressed and reset on released":
Sets the variable to a defined value when the key is pressed, and to another value when it is released

"set – hold – reset":
Sets the variable to a defined value when the key is pressed for the first time, and to another value when it is next pressed

"increment/decrement":
Modifies the variable stepwise in the stipulated increments and defined interval.
At an interval value of 0, only one step is executed.
The variable may not fall below/exceed the preset min./max. values, and stops when the threshold value is reached.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"increment/decrement loop":
Modifies available stepwise in the stipulated increments and defined interval
At an interval value of 0, only one step is executed.
The variable may not fall below/exceed the preset min./max. values. When the threshold value is reached an overflow of min. to max., or vice versa, takes place (loop).

**Note:**

Only integer values can be set via the function "modify variable directly."

"edit variable as numeric"
Opens the numeric keypad for editing variables.

"edit variable as dynamic text"
Opens the Text/Symbol keypad for editing variables as dynamic text.

"edit variable as dynamic symbol"
Opens the Text/Symbol keypad for editing variables as dynamic symbol.

"change to page"
Closes the current page and opens another one.

"change to previous page"
Closes the current page and returns to the previous page.

"open overlay (centered)"
Opens a page as an overlay and positions it centered in the screen. If the overlay is larger than the screen, it is centered in the middle of the page.

"open overlay (by position)"
Opens a page as an overlay and places it in the stipulated position in relation to the upper left corner of the current page.

"close overlay (return to previous)"
Closes the overlay window.

"list up"
Moves the cursor of a list up by one line.

"list down"
Moves the cursor of a list down by one line.

"list page up"
Moves the cursor of a list up by one page.

"list page down"
Moves the cursor of a list down by one page.

"list home"
Moves the cursor to the start of the list.


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"list end"
Moves the cursor to the end of the list.

"list edit variable"
Edits a variable selected in the list.

"character "*""
Via the character keys, you can assign all keypad characters to touchfield/touch keys.

"key "*""
Special keys

"change language"
Changes to the next language.

"alarm confirm"
Confirms the alarms selected in the Alarm List.

"alarm delete"
Deletes the alarm selected in the Alarm List.

"alarm confirm (all)"
Confirms all active alarms.

"alarm delete (all)"
Deletes all alarms.

"alarm history export"
Exports the alarm history to an ASCII file.

"alarm history delete entries"
Deletes the alarm history.

"contrast +/-"
Changes the display contrast.

"backlight +/-"
Changes the display backlight.

"login"
Opens the password login.

"Logout"
Sets the password level to 0 (lowest level).

"change password"
Changes the passwords. The passwords in the system variables SYS_PASSWORD_X are taken over as new passwords.

"recipe new (initialize with defaults)"
Initialized with the recipe editor with default values.

"recipe open"
Opens an existing recipe, displays a selection of all available recipes.

"recipe save"
Saves the recipe under a name to be specified.

"recipe delete"
Deletes the recipe with the name selected.

"recipe upload"
Loads the values from the control into the recipe editor.


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"recipe download"
Downloads the values from the recipe editor into the control.

"recipe open and download"
Opens an existing recipe and downloads the values in the control.

"trend clear"
Deletes the trend buffer.

"trend setup..."
Opens the trend setup window.

"trend setup open"
Opens the selected file with the saved trend settings and updates the respective system variables with the values saved. The system variables SYS_TrendSetupName und SYS_TrendSetupGroup are set accordingly.
Only functions on the page with the trend.

"trend setup save"
Stores the current trend settings in the file whose name is defined via SYS_TrendSetupName. The name can be extended via SYS_TrendSetupGroup.
Only functions on the page with the trend.

"trend setup delete"
Deletes the selected files with the trend settings.
Only functions on the page with the trend.

"trend zoom in"
Extends the time axis.

"trend zoom out"
Compresses the time axis.

"trend export"
Generates an ASCII file of the logged trend.

"online help activation" / "online help deactivation"
Toggles the help mode.

"run program"
Launches another program.

"exit QViS runtime !!!"
Exits QViS, when this is supported by the device/operating system used.

For certain functions, subsequent to their execution, you can furthermore perform a page change.

Variable: Here you specify the variable for button functions that can modify a variable.

Use bitmask: With a bitmask, only the individual bits of the variable are taken into consideration. If a bitmask is used, the resulting value in QViSRT is always 1 or 0.
Bitmask is only displayed when the data type is an integral data type other than BOOL.


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| | |
|---|---|
| Password Level: | The Password Level is defined here. The button function is only executed when the current User Level is greater than or equal to the set Password Level. |
| Type: | Here you define the appearance of the button:<br>Standard button: Gray 3D button<br>Symbol button: two arbitrary symbols determine the button's appearance<br>Transparent button: invisible button |
| "Button up" symbol: | For a symbol button, this symbol is displayed when the button is in a "not depressed" state |
| "Button down" symbol: | For a symbol button, this symbol is displayed when the button is in a "depressed" state |
| Transparent color: | Here you can define a "transparent color." The pixel with this color will not be drawn. |
| Add symbol: | With this option, a symbol can be overlayed on the button. If the option is active, the symbol and an (optional) transparent color can be defined. |
| Add text: | With this option, a text can be overlayed on the button. If the option is active, the text, text color and font can be defined. |
| Lock Position: | If this option is selected, this element can no longer be moved. This option can either be deactivated/activated here, or via the context menu of the element in Work Space. |
| Position X: | Horizontal position of the element in pixel. The value is relative to the page (or to the object) where the element has been inserted. The value 0 is the left margin (or object margin). |
| Position Y: | Vertical position of the element in pixel. The value is relative to the page (or to the object) where the element has been. inserted. |
| Width: | Element width in pixel. In the case of a symbol button, the size automatically ensues from the size of the symbol. |
| Height: | Element height in pixel. In the case of a symbol button, the size automatically ensues from the size of the symbol. |
| Help number: | Help number for this element |
| Condition Hide: | You can define a condition here. If the condition is applicable, the element is hidden. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=). |
| Condition Disable: | You can define a condition here. If the condition is applicable, you can no longer edit the element by clicking onto it. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=). |


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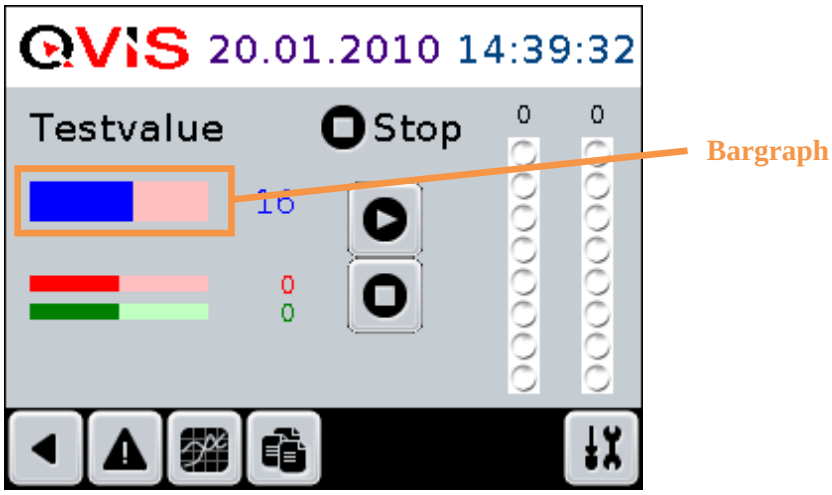
## 3.3.8 Element Bargraph

### 3.3.8.1 What Is the Element Bargraph?

The element "Bargraph" is used to display a bargraph. The bargraph is linked to a variable and changes its size accordingly.




**Note:**

An arbitrarily extended bargraph with min./max. values of 0/1, can also be used as a color changeover for a defined surface.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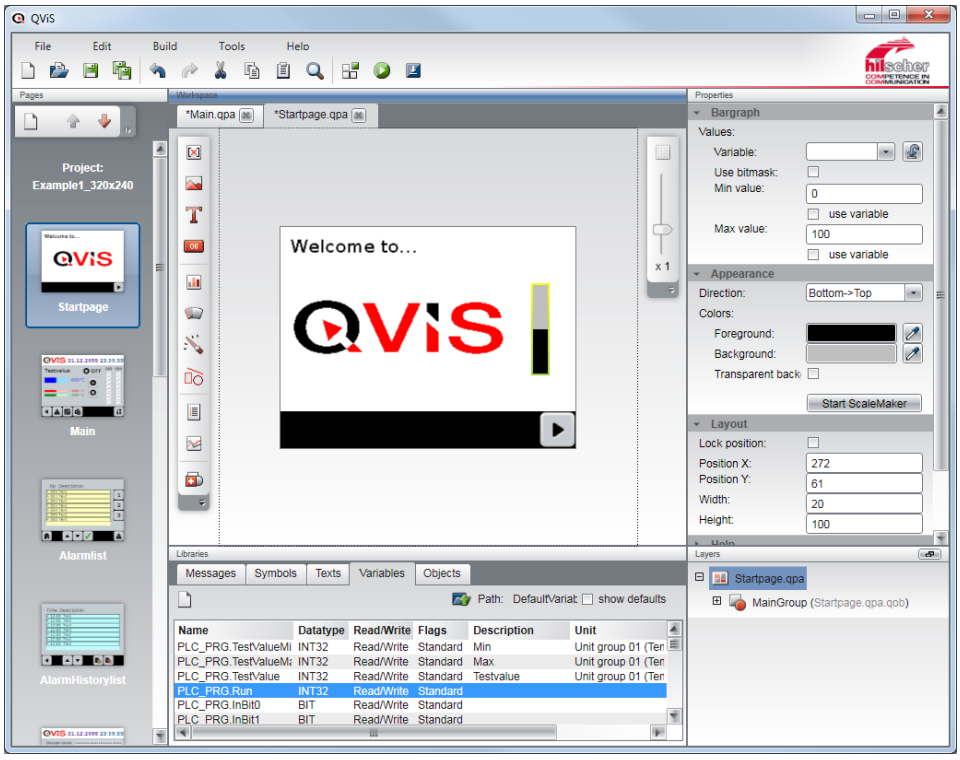
### 3.3.8.2 How Do You Insert and Element Bargraph into QViS?

#### Step 1: Inserting an element

Open a page in Page Editor. In the Element List, click onto the element "Bargraph":

Subsequently click onto the position in the page where you wish to place the element:




#### Step 2: Linking it to a Variable

There are two options for linking the element to a variable.

#### Step 2a: Select a Variable in Properties

Select the element in the page. The element's properties are displayed in the Properties area. Choose the desired variable for the Property "Variable":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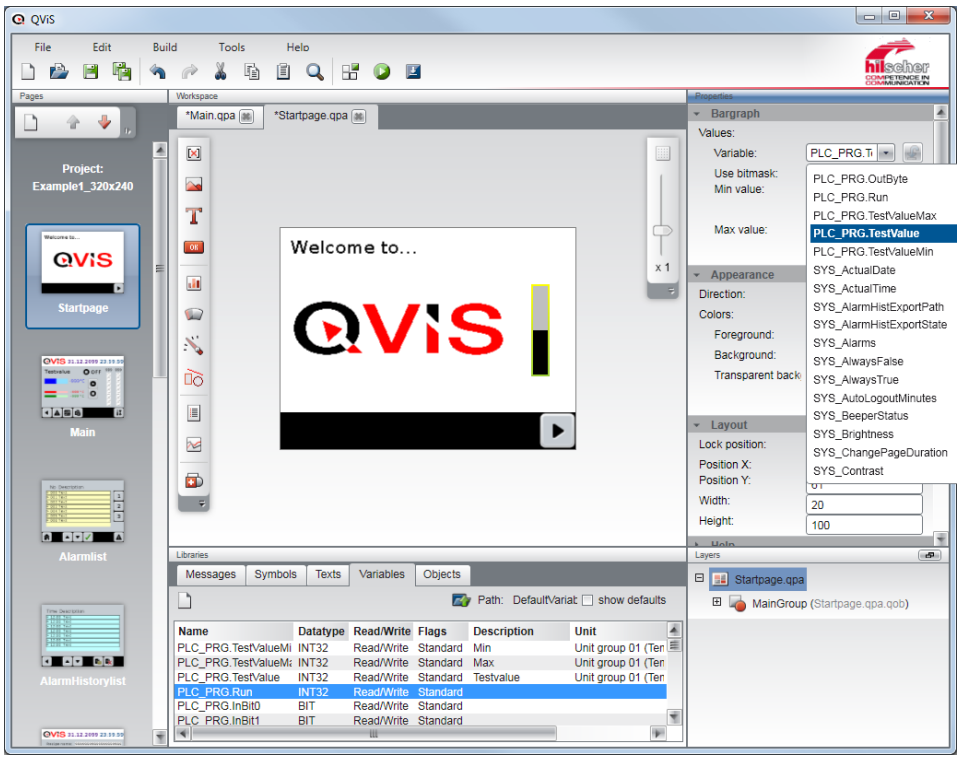
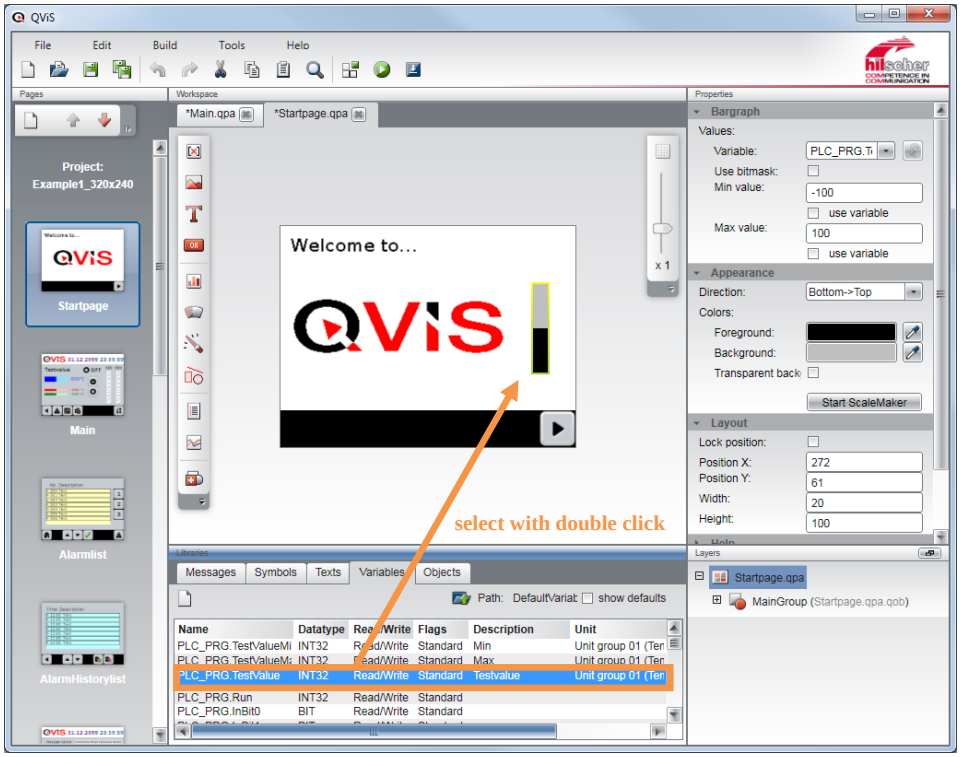



### Step 2b: Select the variable in the Feet Tab

Select the element in the page and double click onto the desired variable in Feet Tab Variables.





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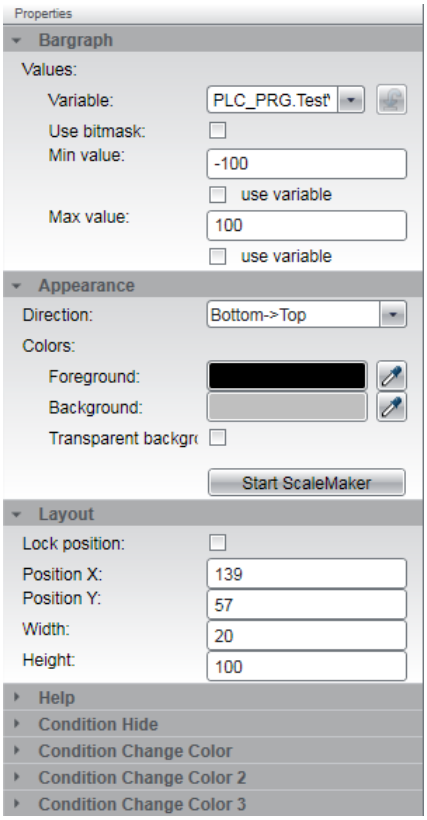
### 3.3.8.3 Properties of the Element Bargraph




Variable: Variable to which the element is linked.

Use bitmask: With a bitmask, only the individual bits of the variable are taken into consideration. If a bitmask is used, the resulting value in QViSRT is always 1 or 0.

Bitmask is only displayed when the data type is an integral data type other than BOOL.

Min value: The value set here corresponds to the minimum bargraph display. This limit can be either a fixed value or linked to a variable.

Max value: The value set here corresponds to the maximum bargraph display. This limit can be either a fixed value or linked to a variable.

Direction: Here you set the bar direction.

Foreground: Foreground bargraph color. The foreground color represents the process value.

Background: Background bargraph color

Transparent background:

If this option has been selected, no background color will be drawn.

Start ScaleMaker: Launches the ScaleMaker to draw a bitmap with a scale. The generated scale is a BMP file, i.e., it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does not change during runtime. The ScaleMaker is described in the chapter "Element Pointer Instrument."

Lock Position: If this option is selected, this element can no longer be moved. This option can either be deactivated/activated here, or via the context menu of the element in Work Space.

Position X: Horizontal position of the element in pixel. The value is relative to the page (or to the object) where the element has been inserted. The value 0 is the left margin (or object margin).

Position Y: Vertical position of the element in pixel. The value is relative to the page (or to the object) where the element has been inserted The value 0 is the upper margin (or object margin).

Width: Element width in pixel.

Height: Element height in pixel.

Help number: Help number for this element

Condition Hide: You can define a condition here. If the condition is applicable, the element is hidden. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=).

Condition Change Color:
You can define a condition here. If the condition is applicable, the element is displayed in another color. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=).

Condition Change Color 2:
You can define a condition here. If the condition is applicable, the element is displayed in another color. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=).

Condition Change Color 3:
You can define a condition here. If the condition is applicable, the element is displayed in another color. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=).


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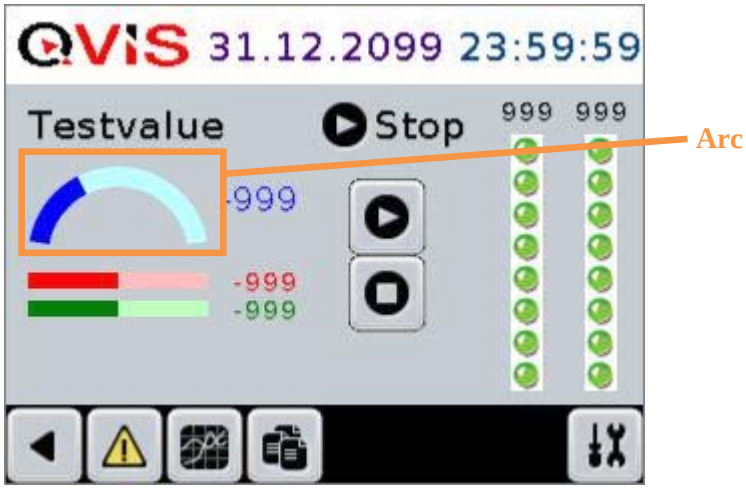
## 3.3.9 Element Arc

### 3.3.9.1 What Is the Element Arc?

The element "Arc" is used to display an arc. The arc is linked to a variable and changes its size accordingly.




### 3.3.9.2 How Do You Insert an Element Arc into QViS?

**Step 1: Inserting an element**

Open a page in Page Editor. In the Element List, click onto the element "Arc":

Subsequently click onto the position in the page where you wish to place the element: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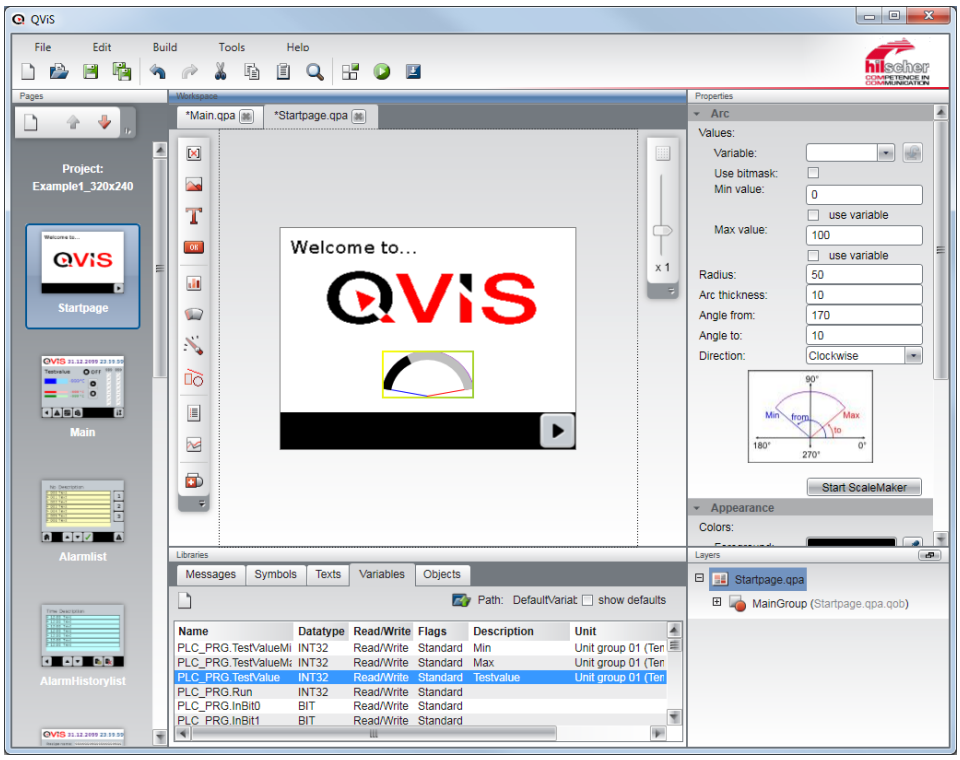
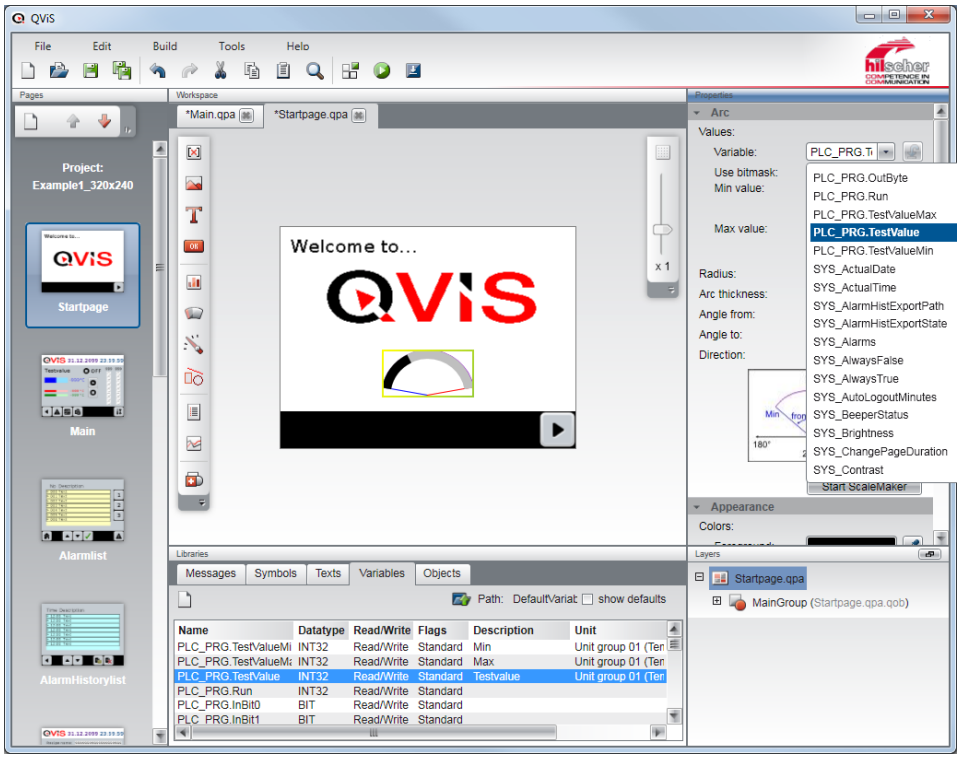



### Step 2: Linking to a variable

There are two options for linking an element to a variable.

### Step 2a: Select a variable in Properties

Select the element in the page. The element's properties are displayed in the Properties area. Choose the desired variable for the Property "Variable," with which this element is to be linked:





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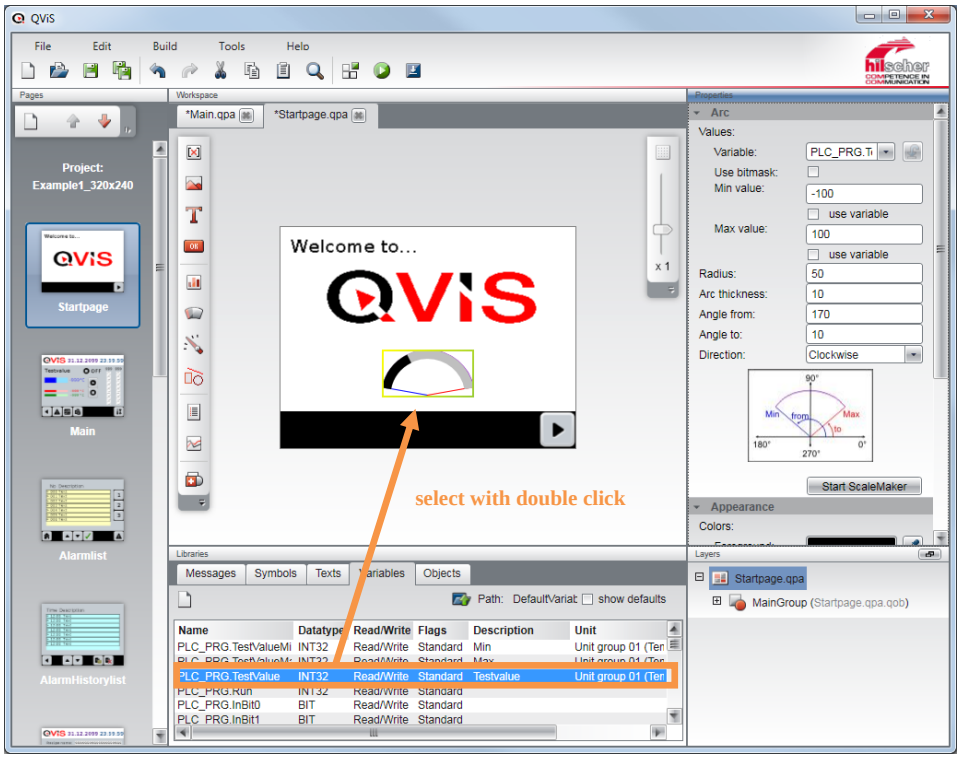
### Step 2.b: Select the variable in the Feet Tab

Select the element in the page and double click onto the desired variable in Feet Tab Variable.





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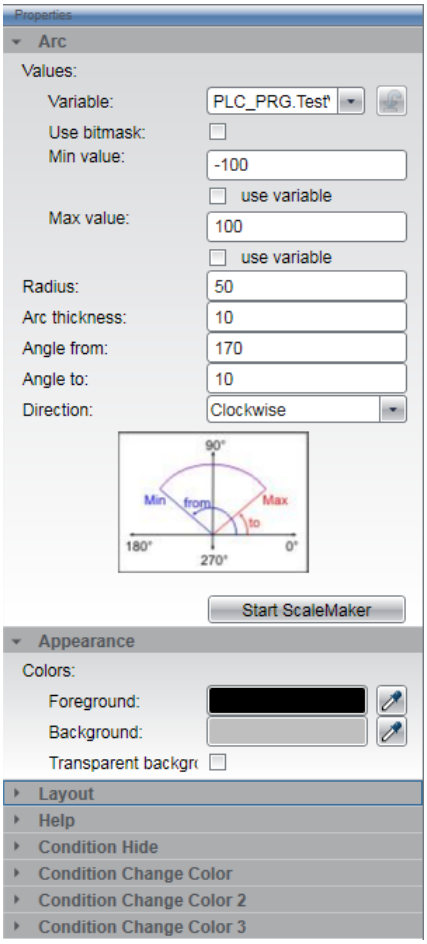
### 3.3.9.3 Properties of the Element Arc




| | |
|---|---|
| Variable: | Variable to which the element is linked. |
| Use bitmask: | With a bitmask, only the individual bits of the variable are taken into consideration. If a bitmask is used, the resulting value in QViSRT is always 1 or 0.<br><br>Bitmask is only displayed when the data type is an integral data type other than BOOL. |
| Min value: | The value set here corresponds to the minimum arc graphic. This limit can be either a fixed value or linked to a variable |
| Max value: | The value set here corresponds to the maximum arc graphic. This limit can be either a fixed value or linked to a variable. |
| Radius: | The radius of the arc is set here. |
| Arc thickness: | Arc thickness in pixel is set here. |
| Angle from: | The angle of the arc in degrees |
| Angle to: | The arc's end angle in degrees. |
| Direction: | Direction of the arc |
| Start ScaleMaker: | Launches the ScaleMaker to draw a bitmap with a scale. The generated scale is a BMP file, i.e., it does not change during runtime. The ScaleMaker is |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described in the chapter "Element Pointer Instrument."

Foreground: Foreground color of the arc graphic

Background: Background color of the arc graphic

Transparent background:
If this option has been selected, no background color will be drawn.

Lock Position: If this option is selected, this element can no longer be moved. This option can either be deactivated/activated here, or via the context menu of the element in Work Space.

Position X: Horizontal position of the element in pixel. The value is relative to the page (or to the object) where the element has been inserted. The value 0 is the left margin (or object margin).

Position Y: Vertical position of the element in pixel. The value is relative to the page (or to the object) where the element has been inserted. The value 0 is the upper margin (or object margin).

Width: Element width in pixel. The size automatically ensues from the selected settings.

Height: Element height in pixel. The size automatically ensues from the selected settings.

Help number: Help number for this element

Condition Hide: You can define a condition here. If the condition is applicable, the element is hidden. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=)

Condition Change Color:
You can define a condition here. If the condition is applicable, the element is displayed in another color. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=).

Condition Change Color 2:
You can define a condition here. If the condition is applicable, the element is displayed in another color. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=).

Condition Change Color 3:
You can define a condition here. If the condition is applicable, the element is displayed in another color. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=).


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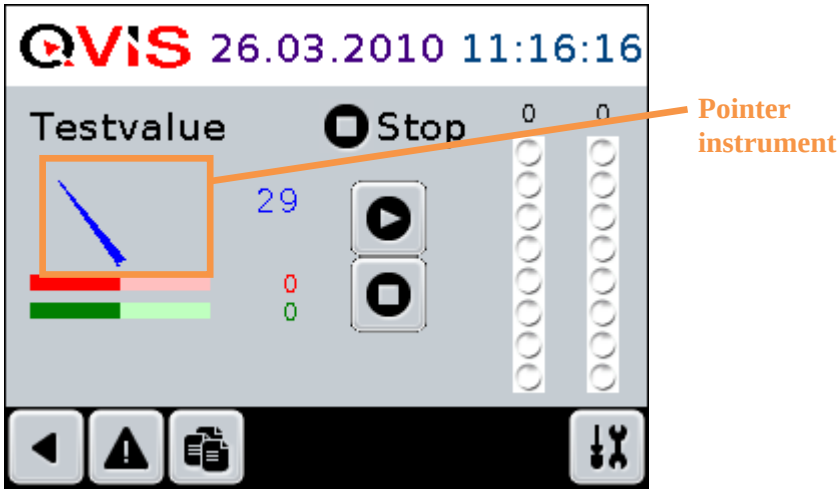
## 3.3.10 Element Pointer Instrument

### 3.3.10.1 What Is the Element Pointer Instrument?

The element "Pointer instrument" is used to display a pointer. The pointer is linked to a variable and changes its angle accordingly.




### 3.3.10.2 How Do You Insert an Element Pointer Instrument into QViS?

**Step 1: Inserting an element**

Open a page in Page Editor. In the Element List, click onto the element "Pointer Instrument":

Subsequently click onto the position in the page where you wish to place the element: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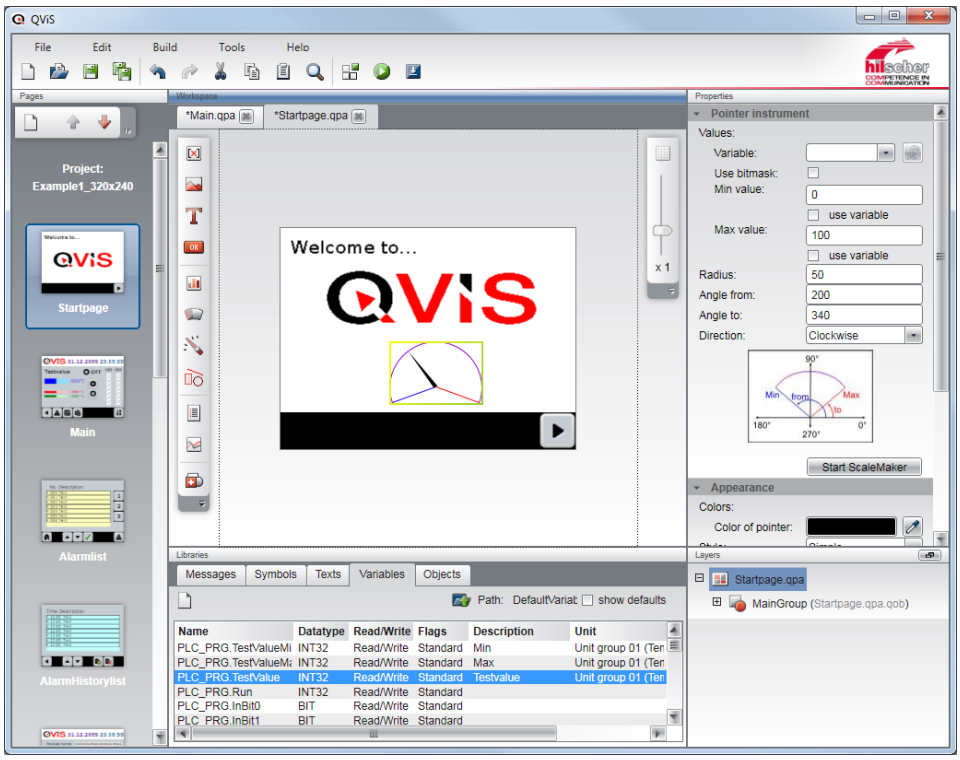
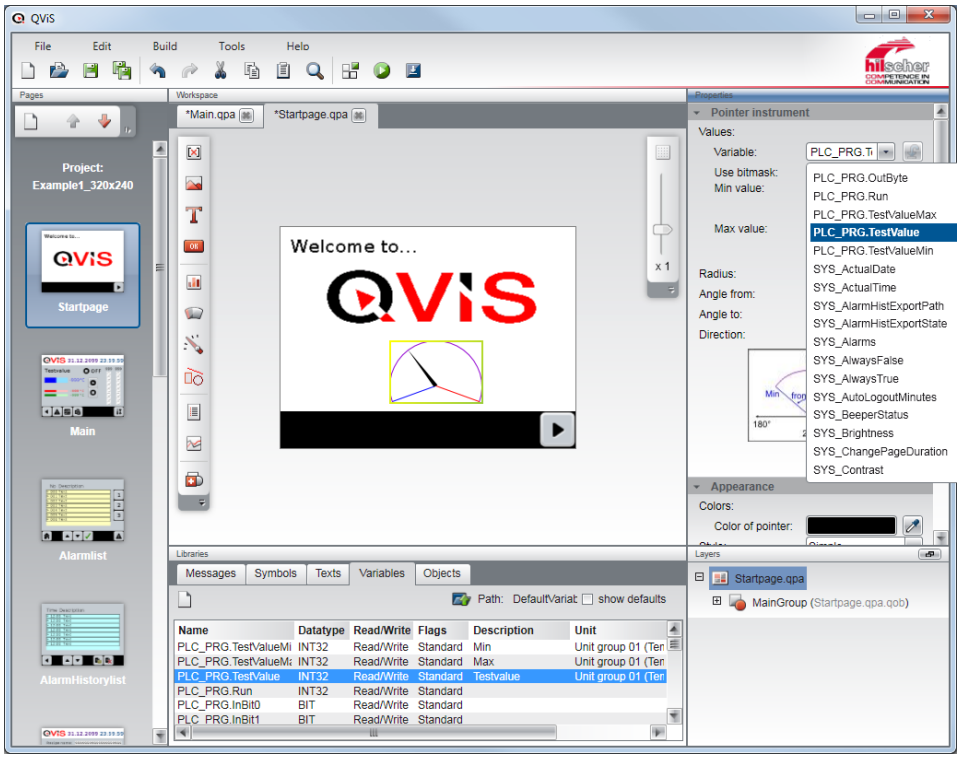



### Step 2: Linking it to a Variable

There are two options for linking the element to a variable.

### Step 2a: Select a Variable in Properties

Select the element in the page. The element's properties are displayed in the Properties area. Choose the desired variable for the Property "Variable":





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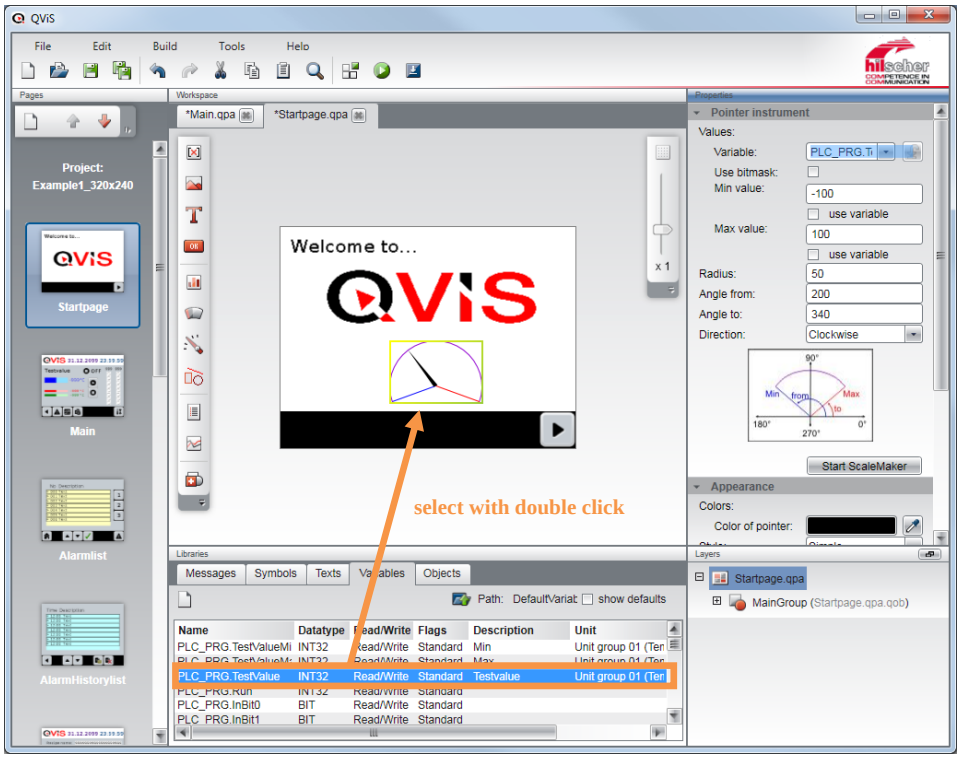
### Step 2b: Select the variable in the Feet Tab

Select the element in the page and double click onto the desired variable in Feet Tab Variables.





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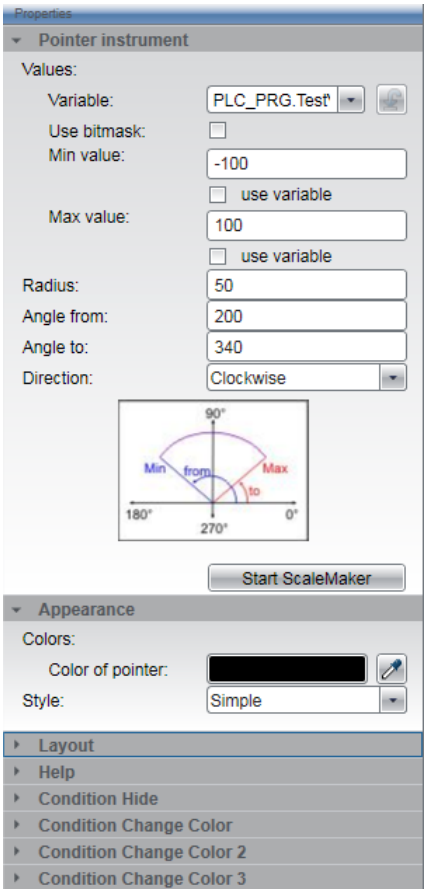
### 3.3.10.3 Properties of the Element Pointer Instrument




| | |
|---|---|
| Variable: | Variable to which the element is linked. |
| Use bitmask: | With a bitmask, only the individual bits of the variable are taken into consideration. If a bitmask is used, the resulting value in QViSRT is always 1 or 0.<br><br>Bitmask is only displayed when the data type is an integral data type other than BOOL. |
| Min value: | The value set here corresponds to the minimum pointer graphic. This limit can be either a fixed value or linked to a variable. |
| Max value: | The value set here corresponds to the maximum pointer graphic. This limit can be either a fixed value or linked to a variable |
| Radius: | The radius of the pointer is set here. |
| Angle from: | The angle of the pointer in degrees |
| Angle to: | The pointer's end angle in degrees. |
| Direction: | Direction of the pointer |
| Start ScaleMaker | Launches the ScaleMaker to draw a bitmap with a scale. The generated scale is a BMP file, i.e., it does not change during runtime. The ScaleMaker is described in the following chapter "Element Pointer Instrument." |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| | |
|---|---|
| Color of pointer: | Color of the pointer |
| Style: | Pointer style "Simple" is a simple pointer, "User defined": You can specify the pointer's form, yourself |
| Pointer points: | The pointer is a polygon. The pointer's corner points can be defined here. The unit for x and y coordinates is percent (100% corresponds to the radius). |
| Lock Position: | If this option is selected, this element can no longer be moved. This option can either be deactivated/activated here, or via the context menu of the element in Work Space. |
| Position X: | Horizontal position of the element in pixel. The value is relative to the page (or to the object) where the element has been inserted. The value 0 is the left margin (or object margin). |
| Position Y: | Vertical position of the element in pixel. The value is relative to the page (or to the object) where the element has been inserted. The value 0 is the upper margin (or object margin). |
| Width: | Element width in pixel. The size automatically ensues from the selected settings. |
| Height: | Element height in pixel. The size automatically ensues from the selected settings. |
| Help number: | Help number for this element |
| Condition Hide: | You can define a condition here. If the condition is applicable, the element is hidden. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=) |
| Condition Change Color: | You can define a condition here. If the condition is applicable, the element is displayed in another color. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=). |
| Condition Change Color 2: | You can define a condition here. If the condition is applicable, the element is displayed in another color. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=). |
| Condition Change Color 3: | You can define a condition here. If the condition is applicable, the element is displayed in another color. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=). |


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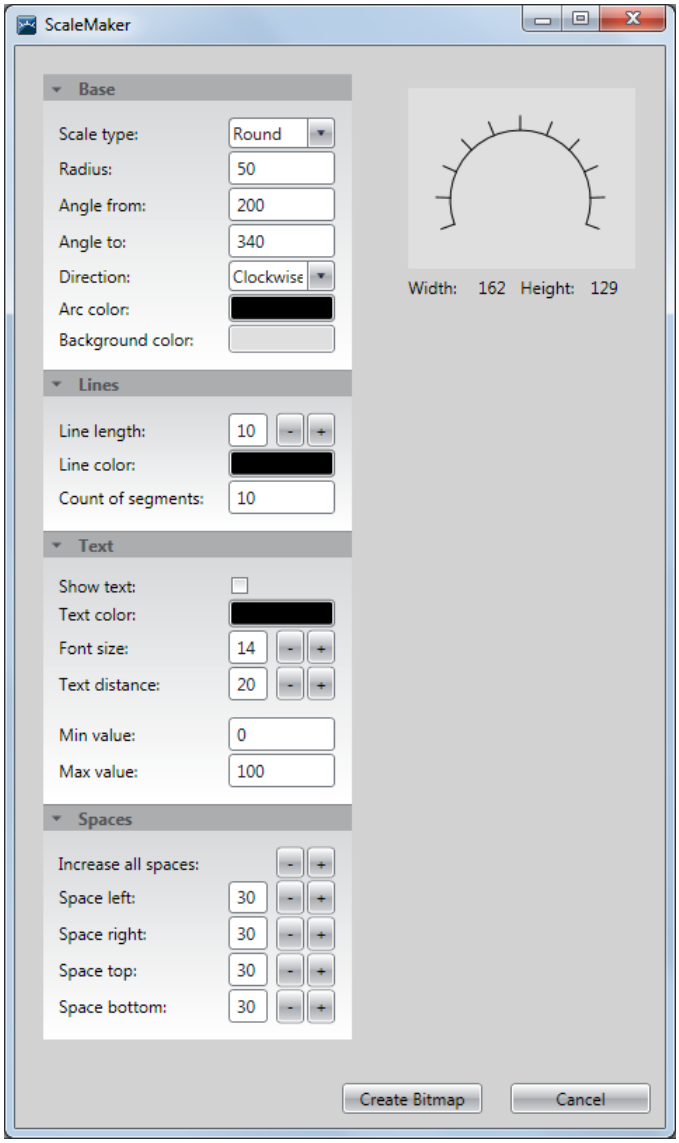
### 3.3.10.4 Creating a Scale Using the ScaleMaker

Using the ScaleMaker, you can draw a simple scale. This scale is saved as a bitmap file (.sm.bmp) and can be used in QViS:




Scale type: Scale type "Round" or "Straight"

**In the case of scale type "Round":**

Radius: Inner radius in pixel

Angle from: Start angle in degrees

Angle to: End angle in degrees

Direction: Direction of the scale

Arc color: Color of the scale line (arc line)

Background color: Background color of the scale

**In the case of scale type "Straight":**

Bargraph width: Bargraph width

Bargraph height: Bargraph height

Direction: Direction of the bargraph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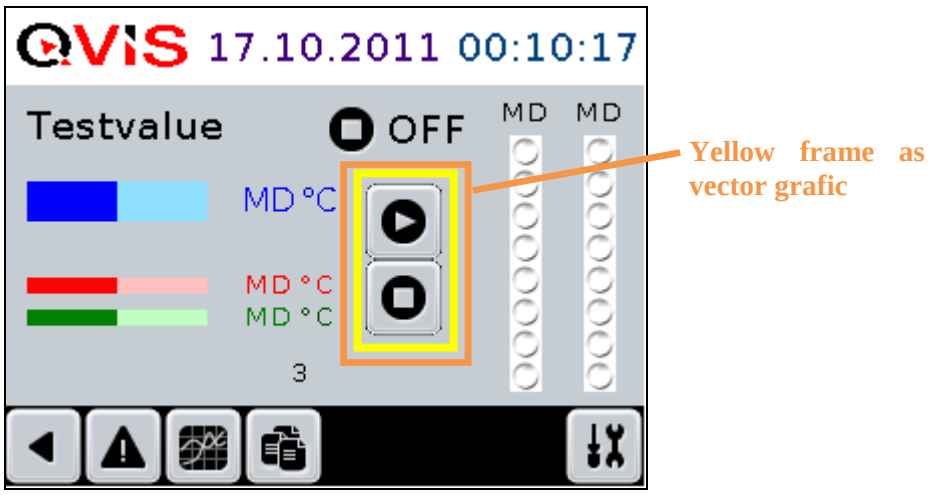
| | |
|---|---|
| Foreground color: | Color of the scale line (long line) |
| Background: | Background color of the scale |
| Swap position: | Reverse the scale's position (up<->down, left <-> right) |
| Line length: | Line length in pixel |
| Line color: | Line color |
| Count of segments: | Number of segments |
| Show text: | Activate or deactivate text |
| Text color: | Text color |
| Font size: | Font size |
| Text distance: | Distance of text to scale |
| Min/Max value: | Minimum and maximum values; these are used to generate texts |
| Spaces: | Margin distances in pixel |

## 3.3.11 Element Vector Graphic

### 3.3.11.1 What Is the Element Vector Graphic?

The element "Vector graphic" is used to create and display simple vector graphics directly in QViS.





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### 3.3.11.2 How Do You Insert an Element Vector Graphic into QViS?

**Step 1: Inserting an element**

Open a page in Page Editor. In the Element List, click onto the element "vector graphic":

Subsequently click onto the position in the page where you wish to place the element. The Graphic Editor will open instead of the Page Editor:

**Step 2: Creating a vector graphic using the Graphic Editor**

The view changes and the Graphic Editor comes to the foreground.

In the Graphic Editor, you can only create rectangles, ellipses, lines and free-hand drawings and modify their properties:


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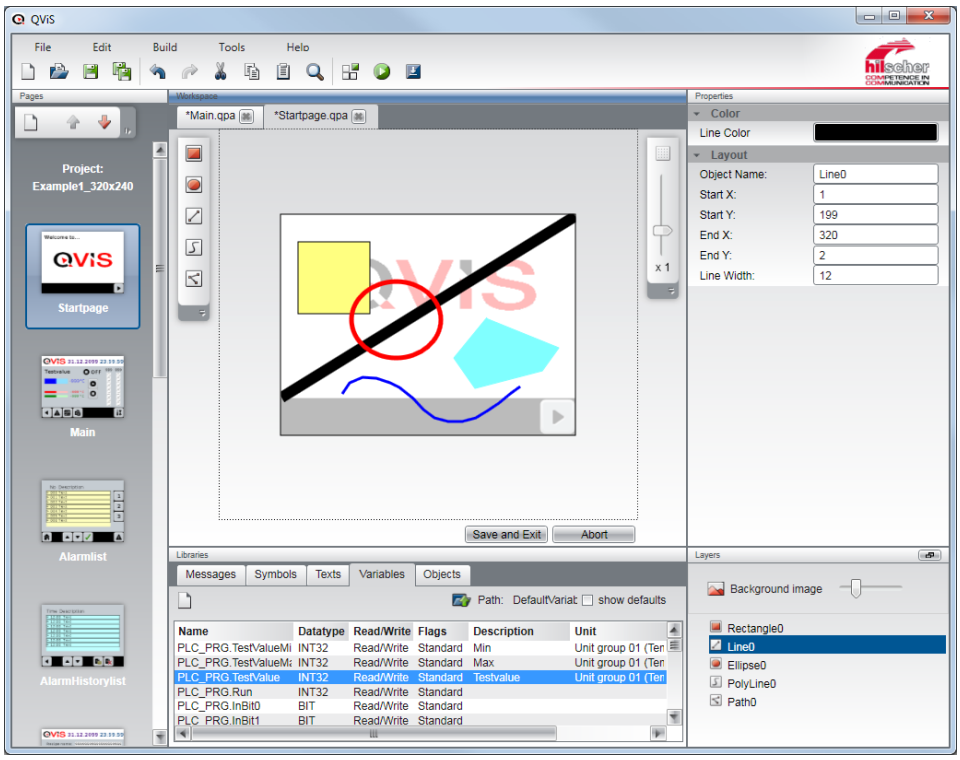


The editor has command over the following five basic elements:

| | |
|---|---|
| Rectangle | To display rectangles of any type and size. |
| Ellipse | To display ellipses and circles of any type and size. |
| Line | To display lines of any position and length. |
| Pencil | To display free-hand drawings of any type and shape/form. |
| Path | To display arbitrary "angular" interrelated lines and polygons. |

In the Properties, the position, line thickness and if needed, fill color, are freely selectable for each drawn element.

To display overlaps as desired, each drawn element is allocated to a layer. The layers are viewable and shiftable in the layer overview in order. The position of the layer can be modified via the context menu.

In the layer view, the background image intensity can be adjusted to make proportions and positions of the elements visible on the current page, which provides for orientation.

### Step 3: Exiting the graphic editor

You can exit the editor via "Save and Exit" or "Abort," whereby the changes are only taken over by "Save and Exit."

After exiting the graphic editor, you are returned to View Page.


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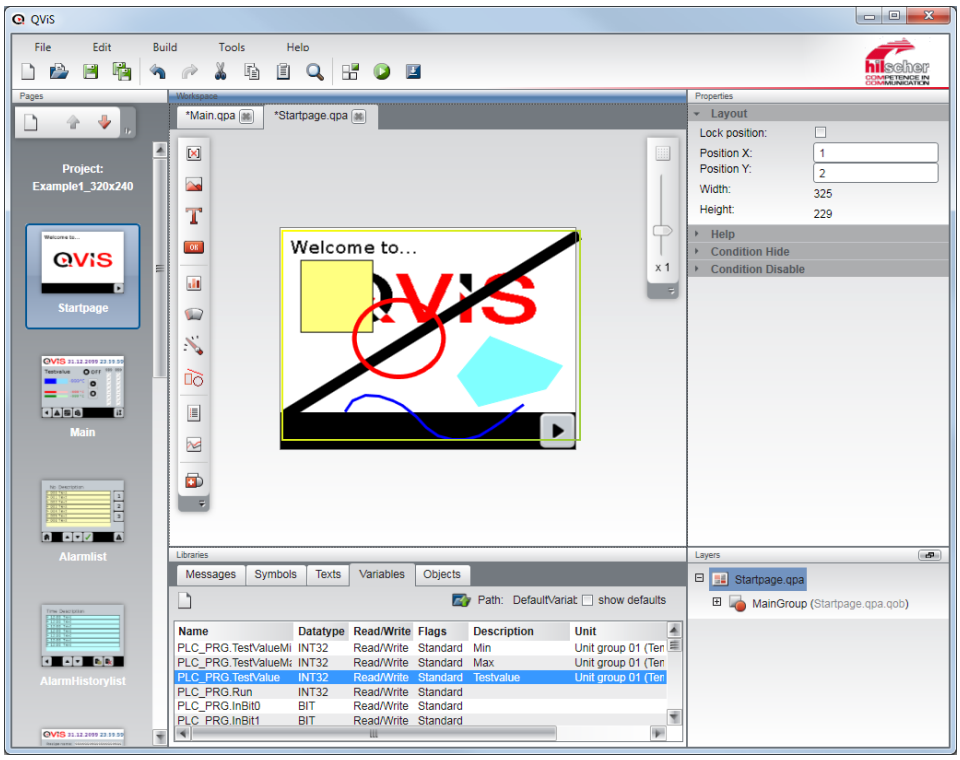
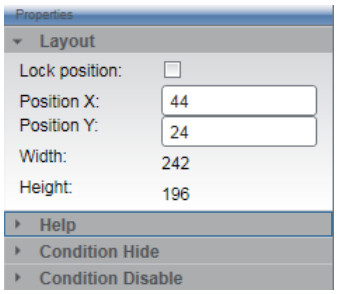



The selected element "Vector graphic" has, as do all other elements, a set of properties, which can be edited via "Properties."

### 3.3.11.3 Properties of the Element Vector Graphic




| | |
|---|---|
| Lock Position: | If this option is selected, this element can no longer be moved. This option can either be deactivated/activated here, or via the context menu of the element in Work Space. |
| Position X: | Horizontal position of the element in pixel. The value is relative to the page (or to the object) where the element has been inserted. The value 0 is the left margin (or object margin). |
| Position Y: | Vertical position of the element in pixel. The value is relative to the page (or to the object) where the element has been inserted. The value 0 is the upper margin (or object margin). |
| Width: | Element width in pixel. In the case of a symbol button, the size automatically ensues from the symbol's size. |
| Height: | Element height in pixel. In the case of a symbol button, the size automatically ensues from the symbol's size. |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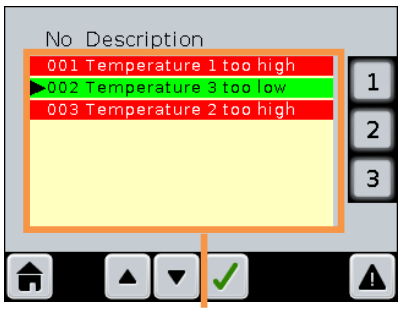
| | |
|---|---|
| Help number: | Help number for this element |
| Condition Hide: | You can define a condition here. If the condition is applicable, the element is hidden. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=) |
| Condition Disable: | You can define a condition here. If the condition is applicable, you can no longer edit the element by clicking onto it. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=) |

## 3.3.12 Element List

### 3.3.12.1 What Is the Element List?

The element "List" is used to display the following:

- A list of numerous variable values
- An Alarm or Alarm History list
- A list needed for creating an input window




Alarm list

Variable list

### 3.3.12.2 How Do You Insert an Element List into QViS?

**Step 1: Inserting an element**

Open a page in Page Editor. In the Element List, click onto the element "List":

Subsequently click onto the position in the page where you wish to place the element: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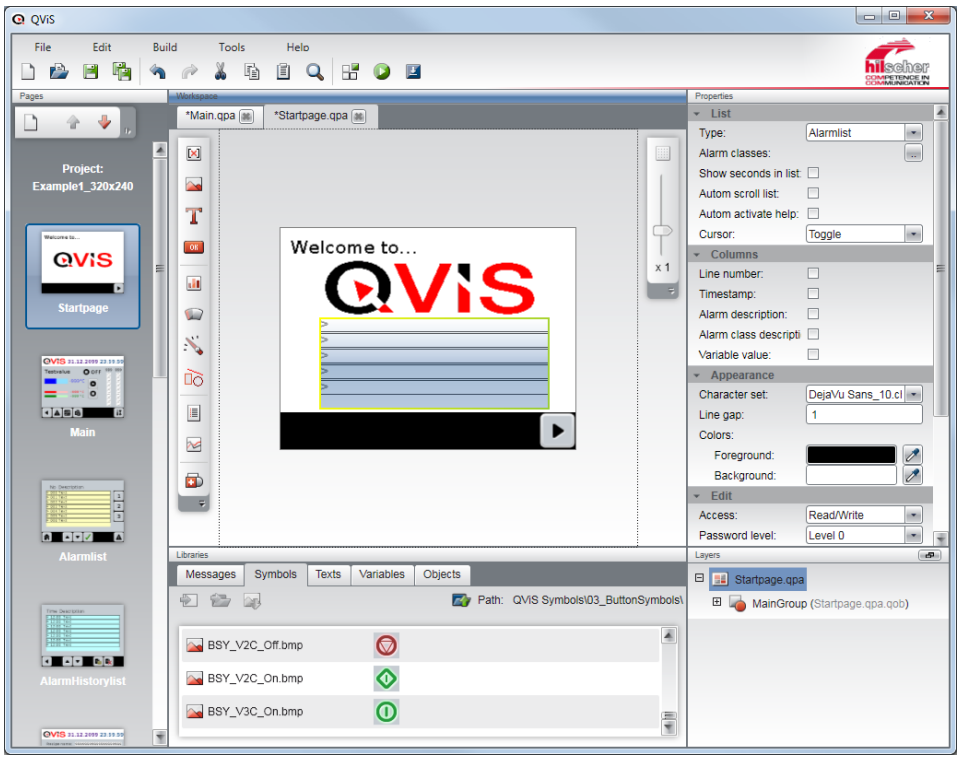
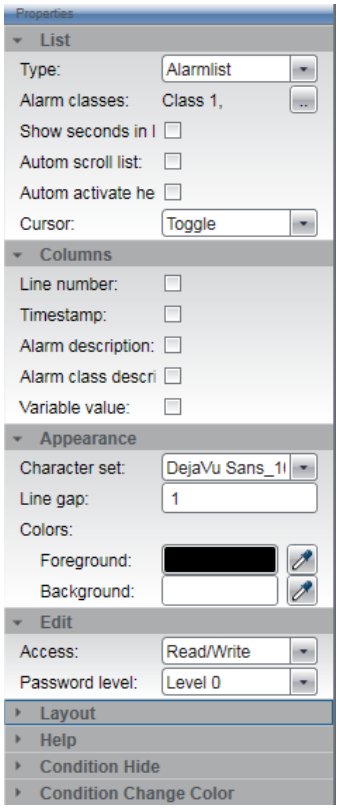



**Step 2: Specifying List Types and Columns**

Select the element on the page. The element's properties are displayed in the Properties area. Choose the list type, activate the desired columns and define the position of the individual columns.

You can find detailed examples of lists in the chapter "Application Examples."

### 3.3.12.3 Properties of the Element List





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| | |
|---|---|
| Type: | You define the list type here:<br><br>Variable list:<br>This is a list containing numerous variable values. This list is used, e.g., when many variable values are to be displayed.<br>Alarm list:<br>In an alarm list, the active alarms and their respective status can be displayed.<br>Alarm history list:<br>In an alarm history list, the times when alarms were active can be displayed.<br><br>Input list:<br>This list is needed when an input mask for dynamic symbols or texts are to be created. |
| Variables: | These variables are listed in the variable list. |
| No unit conversion: | If this option has been selected, the values of the variables are not converted to their set units. |
| Alarm classes: | Only alarms of this alarm class are displayed in the alarm list. |
| Show seconds in list: | If this option has been selected, the times, including seconds, are displayed in the column "Timestamp." |
| Automatically scroll list: | If this option has been selected, the alarm list is periodically further scrolled. |

**Note:**

Please ensure that the cursor is activated and no element for operating the list is available on the page.

Automatically activate help:
The help mode for the alarm list is always active and by clicking onto the alarm list, the online help for the selected alarm is unhidden.

**Note:**

The online help is only displayed for the marked variable when it has also been assigned a help number.

| | |
|---|---|
| Cursor: | Disable: The list has no cursor.<br>Enable: The cursor of the list is always activated.<br>Toggle: The cursor can be activated and deactivated via a mouse click or by touch. |
| Line number: | Sequential number per line. |
| Variable description: | Description text from the variable declaration. |


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| | |
|---|---|
| Value: | Variable value |
| Unit: | Description text of the unit of the variable. |
| Min, Max value: | The limits of the variable declaration. |
| Default: | The default value of the variable declaration. |
| Timestamp: | Timestamp with date and time (optionally with seconds) |
| Alarm description: | Description text from the variable declaration. |
| Alarm class description: | Description text from the alarm class. |
| Variable: | Variable value when the alarm occurs. Any alarm variable can store the value of a variable. This variable is set in the variable declaration of the alarm variable (Variable to store). |
| Date: | Date |
| Time: | Time (optionally with seconds) |

**Note:**

The information field "Timestamp" contains the same declarations as in the mutual use of the information fields "Date" and "Time."

| | |
|---|---|
| Character set: | The Character Set (font) set here is used here is for displaying the texts. |
| Line gap: | Distance between the individual lines in pixel. |
| Fore-/Background: | Text color<br>Alarms in the alarm lists are displayed in the color of their alarm class (refer to Project Properties, Alarms) |
| Background: | Background color of the list |
| Access: | The list content can only be edited when Read/Write is set here. |
| Password Level: | The Password Level is defined here. The list content can only be when the current User Level is greater than or equal to the set Password Level. |
| Lock Position: | If this option is selected, this element can no longer be moved. This option can either be deactivated/activated here, or via the context menu of the element in Work Space. |
| Position X: | Horizontal position of the element in pixel. The value is relative to the page (or to the object) where the element has been inserted. The value 0 is the left margin (or object margin). |
| Position Y: | Vertical position of the element in pixel. The value is relative to the page (or to the object) where the element has been inserted. The value 0 is the upper margin (or object margin). |


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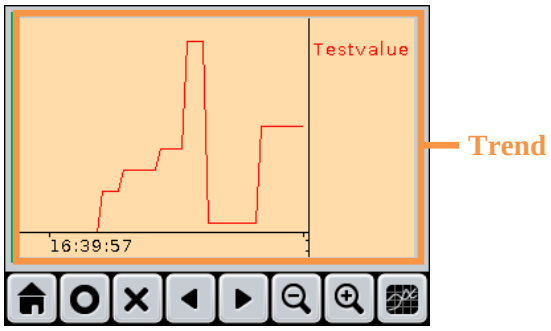
| | |
|---|---|
| Width: | Element width in pixel. |
| Height: | Element height in pixel. |
| Help number: | Help number for this element |
| Condition Hide: | You can define a condition here. If the condition is applicable, the element is hidden. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=) |
| Condition Change Color: | You can define a condition here. If the condition is applicable, the element will be displayed in another color. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=) |

## 3.3.13 Element Trend

### 3.3.13.1 What Is the Element Trend?

The element "Trend" is used to graphically display the trend of the variable values.




**Note:**

A Trend can display a maximum of eight variables.

Only one "Trend" element can be created per page.

A maximum of four Trends per project, distributed over four pages, can be used.

### 3.3.13.2 How Do You Insert an Element Trend into QViS?

The Trend functionality can be deactivated for the existing device. If the trend functionality is deactivated, no Trend element can be inserted.

**Step 1: Inserting an element**

Open a page in Page Editor. In the Element List, click onto the element "Trend":

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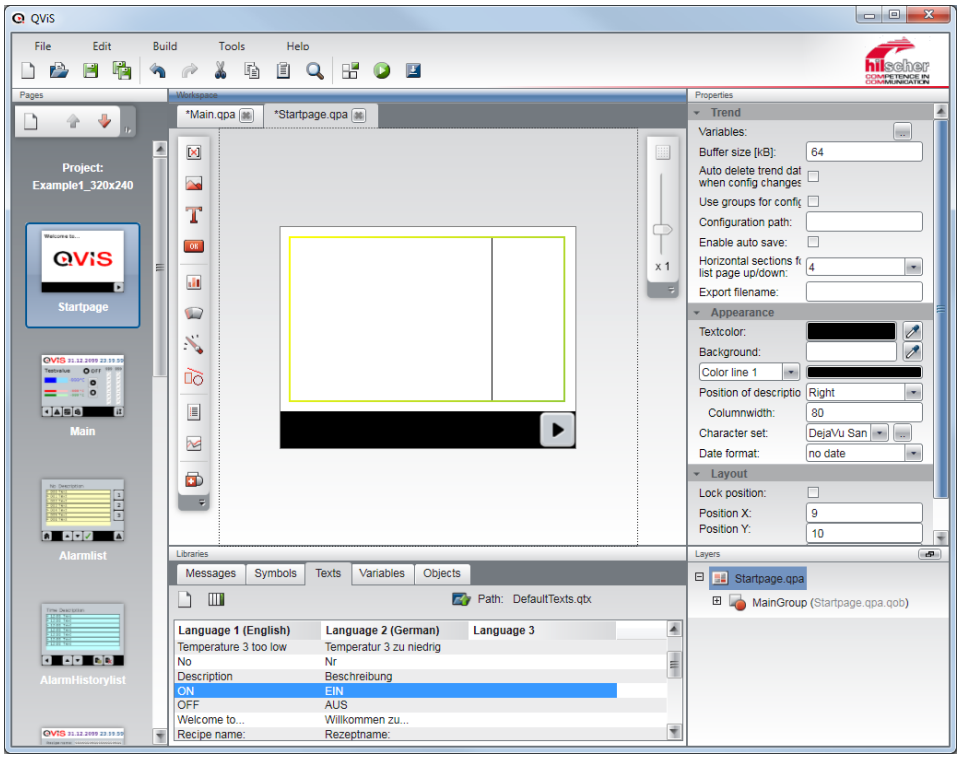
Subsequently click onto the position in the page where you wish to place the element:

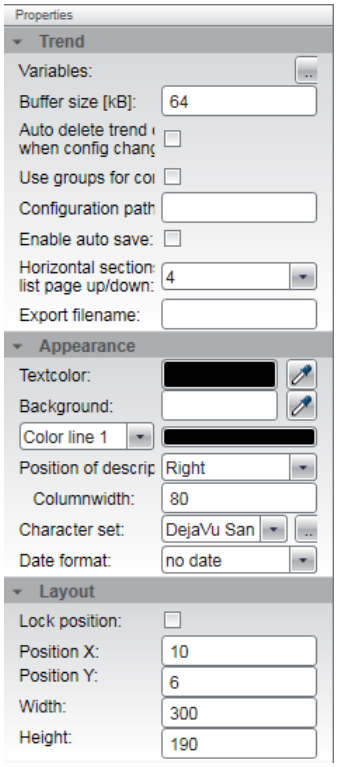



**Step 2: Defining Properties**

Select the element in the page. The element's properties are displayed in the Properties area. Choose which variables can be logged, define the colors and size of the Trend.

You can find detailed examples of lists in the chapter "Application Examples."

### 3.3.13.3 Properties of the Element Trend





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| | |
|---|---|
| Variables: | The possible variables which can be configured for logging are selected here. |
| Buffer size [kB]: | Buffer size |
| Auto delete trend data, when config changes: | If this option has been selected, configuration changes of the logged data are automatically deleted to activate the changes. Logging can then be launched. |
| Use groups for config: | Trend configurations can be merged to groups. This function is activated via this setting. |
| Configuration path: | Directory under which the trend configurations are to be saved. |
| Enable auto save: | When this option is activated, the logged data are saved in a file. If such a file exists when QViSRT is launched, the content is loaded and displayed in the Trend window. |
| Horizontal areas for list page up/down: | Number of horizontal areas. Via the function "list page up/down," the cursor jumps one are farther. |
| Export filename: | The function "trend export" can be called up via a button. Should this take place, a tabulator-separated ASCII file is saved under the specified name, which can be further processed by any common text editor at a later date. |
| Text color: | Text color for the texts (legend, values) |
| Background: | Background color of the element |
| Color line 1 – 8: | Color of the lines |
| Position of description: | Position of the legend display on the lower margin or on the right side |
| Column width: | Width of the legend display, should it be located on the right margin |
| Character set: | Character set (font) for texts |
| Date format: | Display format for the date |
| Lock Position: | If this option is selected, this element can no longer be moved. This option can either be deactivated/activated here, or via the context menu of the element in Work Space. |
| Position X: | Horizontal position of the element in pixel. The value is relative to the page (or to the object) where the element has been inserted. The value 0 is the left margin (or object margin). |
| Position Y: | Vertical position of the element in pixel. The value is relative to the page (or to the object) where the element has been added. The value 0 is the upper margin (or object margin). |
| Width: | Element width in pixel. |
| Height: | Element height in pixel. |


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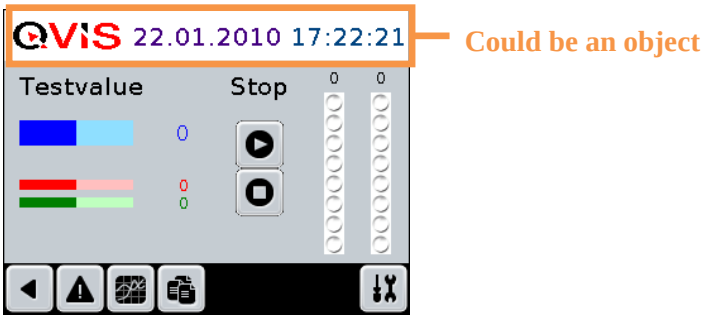
## 3.3.14 The Object

### 3.3.14.1 What Is an Object?

An object is a group of several elements. An object can be inserted into a page:

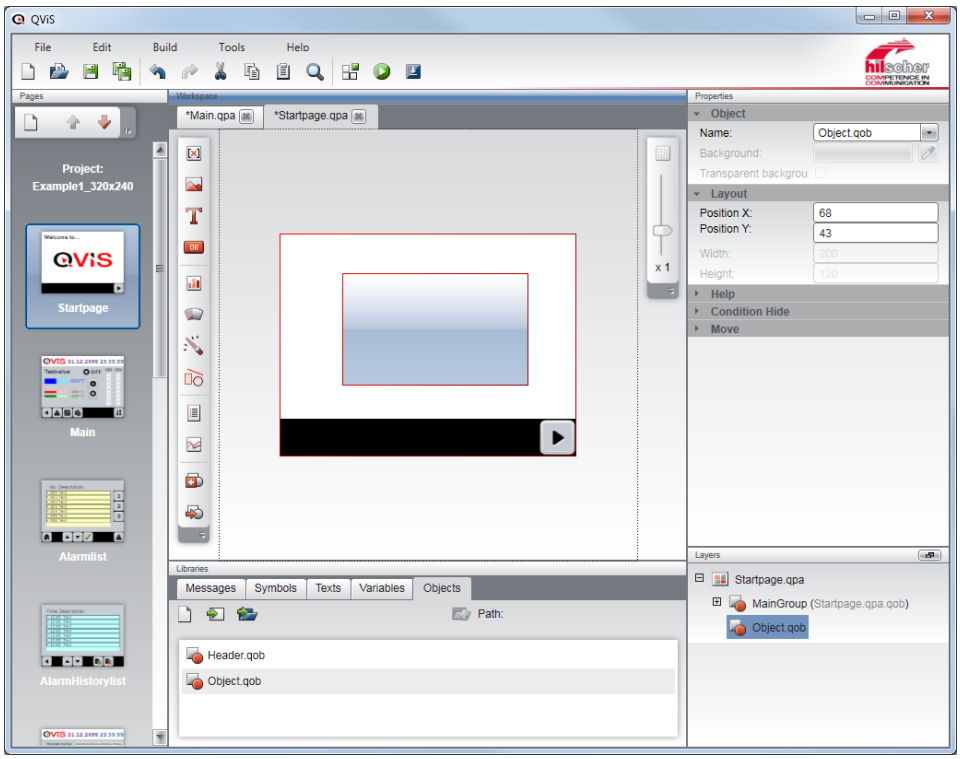



### 3.3.14.2 How Do You Insert an Object into QViS?

**Step 1a: Inserting a new object**

Open a page in Page Editor. In the Element List, click onto the button "Insert a new object" in the Element list:

Subsequently click onto the position in the page where you wish to place the element. You can also keep the mouse depressed and "pull" a frame to define the object's size:





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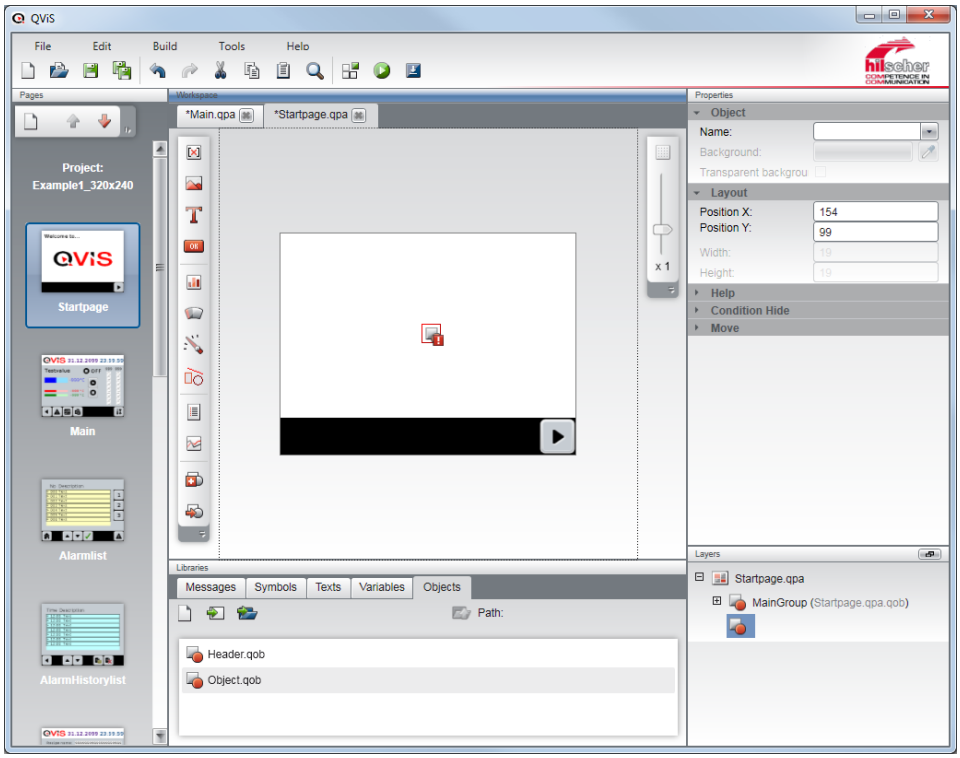
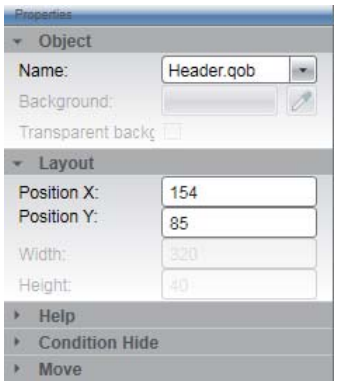
**Step 1b:Inserting an existing object**

Should you wish to insert an existing object in a page, click onto the button "Insert a new object" in the Element list:

Subsequently click onto the position in the page where you wish to place the element. Select the object and for assigning, choose an object in Properties:




## 3.3.14.3 Properties of an Object:




| | |
|---|---|
| Name: | The object name is displayed here, and another object can be selected. |
| Background: | Background color of the object |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Transparent background:
: If this option is selected, no background will be drawn.

Position X:
: Horizontal position of the object in pixel. The value is relative to the page where the object has been inserted. The value 0 is the left margin.

Position Y:
: Vertical position of the object in pixel. The value is relative to the page where the object has been inserted. The value 0 is the upper margin.

Width:
: Object width in pixel.

Height:
: Object height in pixel.

Help number:
: Help number for this object

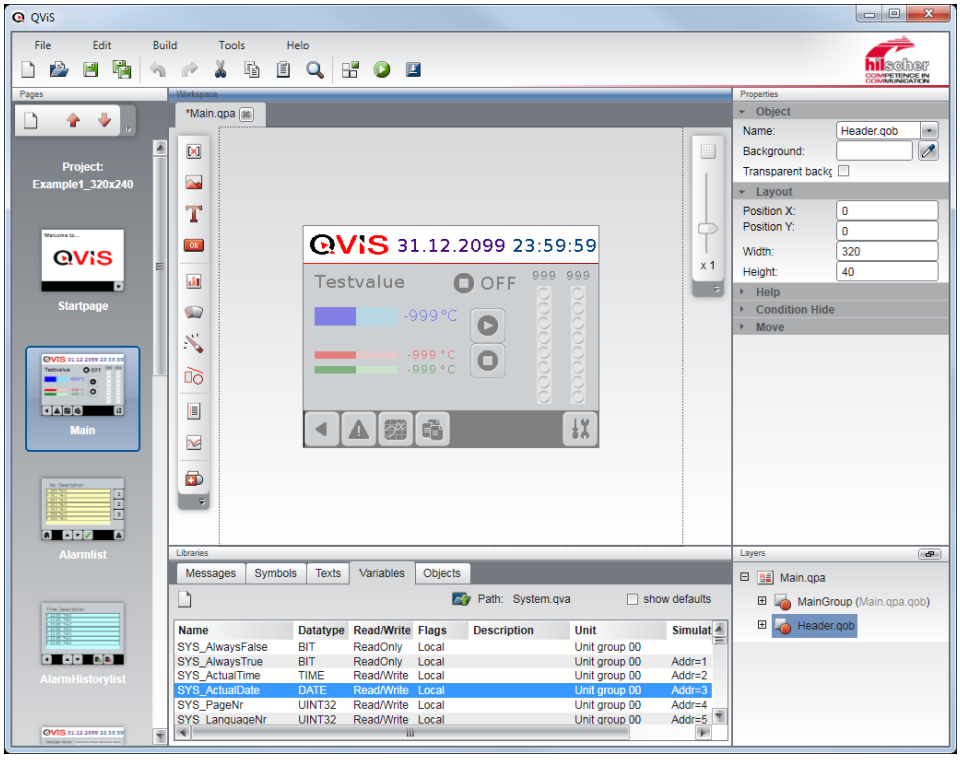
Condition Hide:
: You can define a condition here. If the condition is applicable, the object is hidden. The condition is comprised of variable, which is compared with a value or variable and a comparator (e.g. >=).

Condition Move:
: Here you can link the object to two variables. During runtime, the object will be drawn with an offset determined by the values of these variables. The unit is pixel.

### 3.3.14.4 How Do You Edit an Object?

An object is edited in Object Editor. There are two options for opening an object in Object Editor:

- On a page:
  If an object has been inserted on a page, the object can be directly edited in this page. To do so, open the page via Page Editor and then double-click onto the object:





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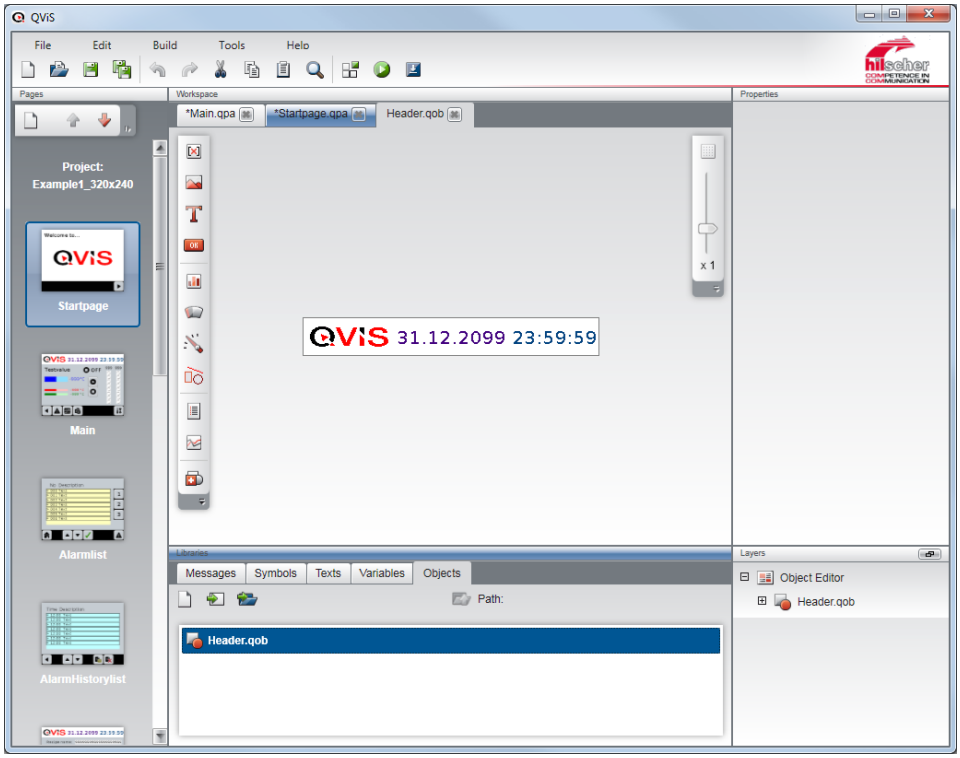
- Only the object, itself:
  The object is opened by double-clicking onto the object in the Feet Tab "Objects":

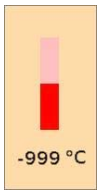



The same elements can be added to an object, as to a page. Operating the Object Editor is also the same as for Page Editor.

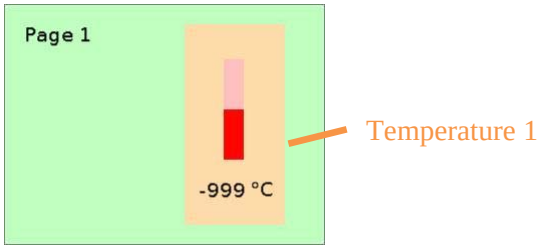
### 3.3.14.5 Object Instances

If an object is used numerous times, specific properties may vary in each object instance. The case of an object that is used numerous times having different properties could either be desired, or not. The following two use cases are possible:

Object:




Application Case A: The same temperature is to be displayed on each page.





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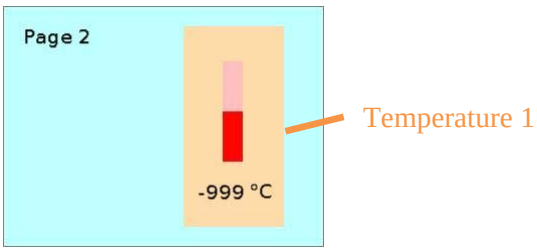
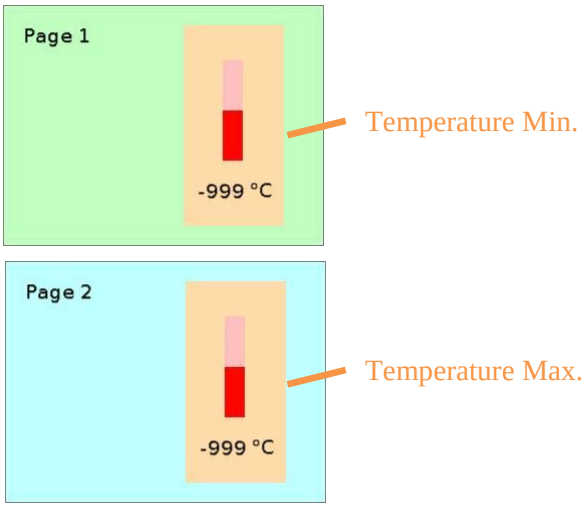
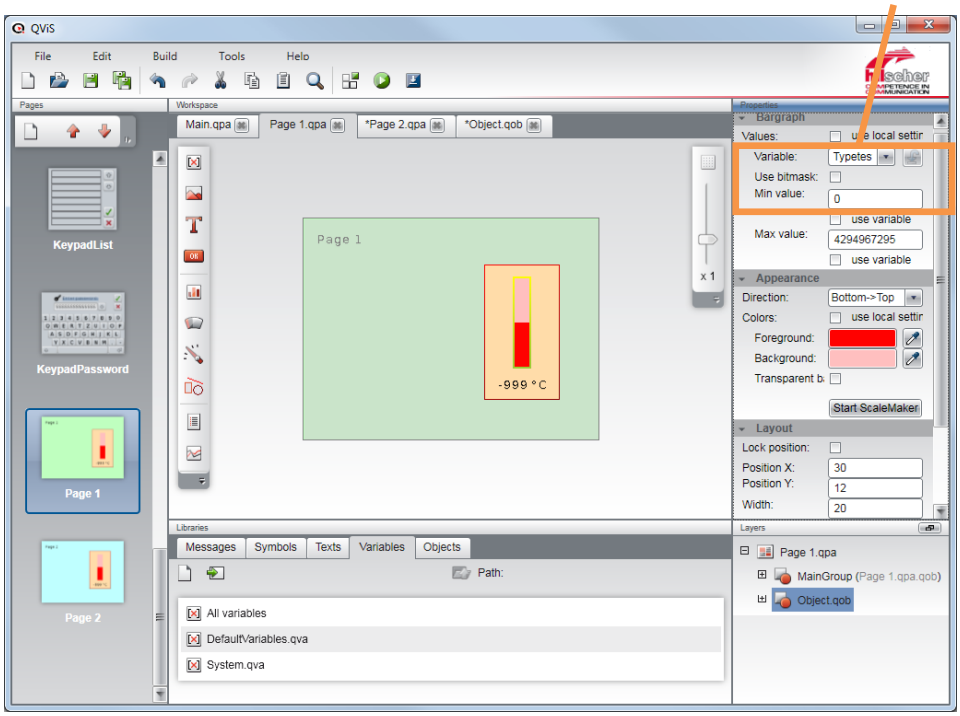



Application Case B: A different temperature is to be displayed on each page.




If an object is used numerous times, for some properties the additional option "use local settings" is displayed:




If you do not select "use local settings," the following properties (indented properties) are global, i.e., these properties are unique and any changes to them will affect all object instances, where likewise "use local settings" was not selected. In our example, that would be Application Case A.

If you select "use local settings," the following properties (indented properties) are only locally valid (only for this object instance). Changing local settings will not affect other object instances. In our example, that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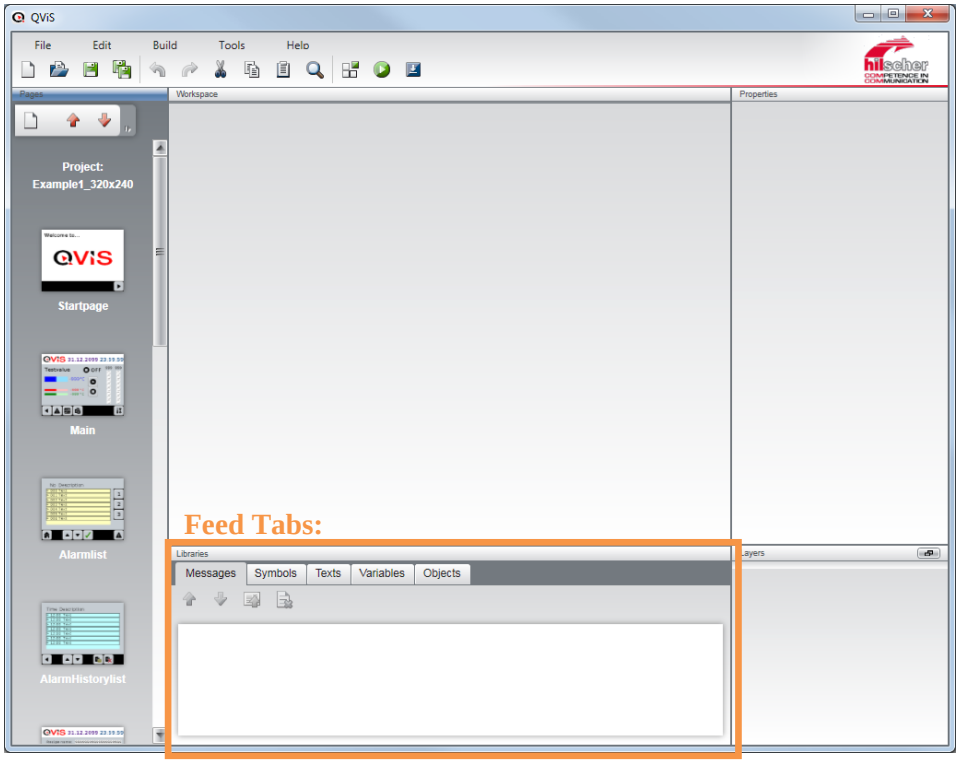
would be Application Case B and the settings are "use local, Variable=TempMin" and "use local, Variable=TempMax."

## 3.4 The Feet Tabs

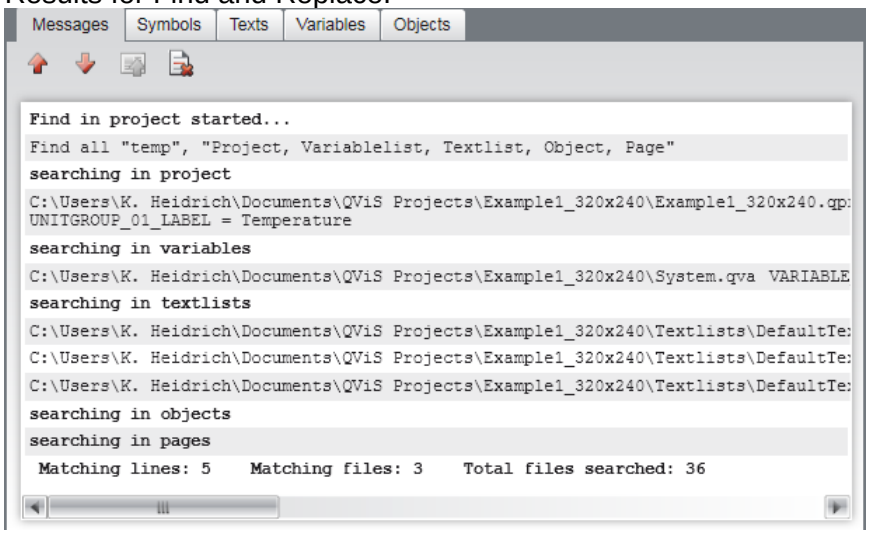
In the lower area, you will see five registers (tabs), called "Feet Tabs":




### 3.4.1 Messages

The messages are used for:

- Results for Find and Replace.





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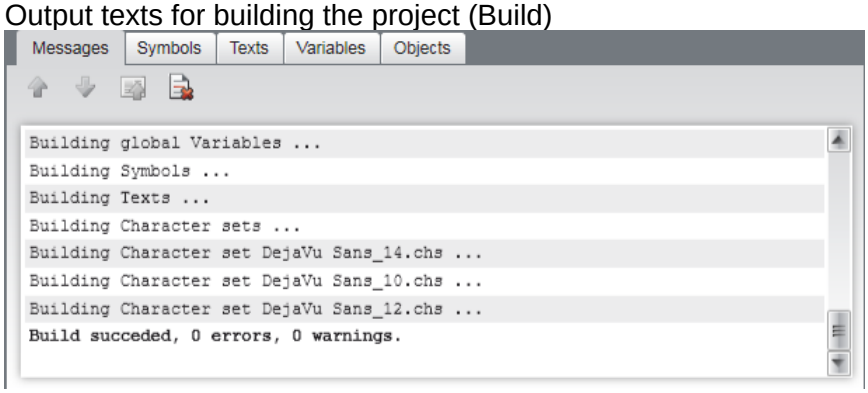
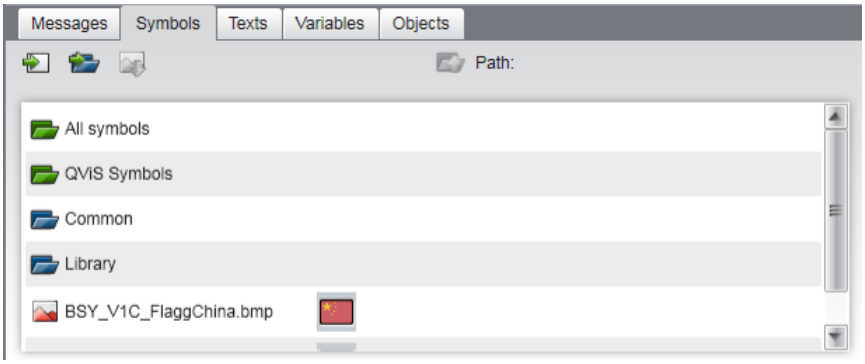
- Output texts for building the project (Build)




## 3.4.2 Symbols




In the Feet Tab "Symbols," you can view and delete the symbols (image files) contained in the project. Furthermore, new symbols can be added to the project.

**Note:**

Bitmap types BMP are supported.

The symbols can be stored in sub-files. However, on the hard disk, all symbols are stored in the same directory. The sub-files in QViS are only virtual files.

In the file "All symbols", all symbols are comprised that were added to the current project.

All symbols provided with QViS are located in the file "QViS Symbols." By double-clicking onto a symbol in the Symbol Library (or via a right click and "add to project"), the symbol is copied and added to the project.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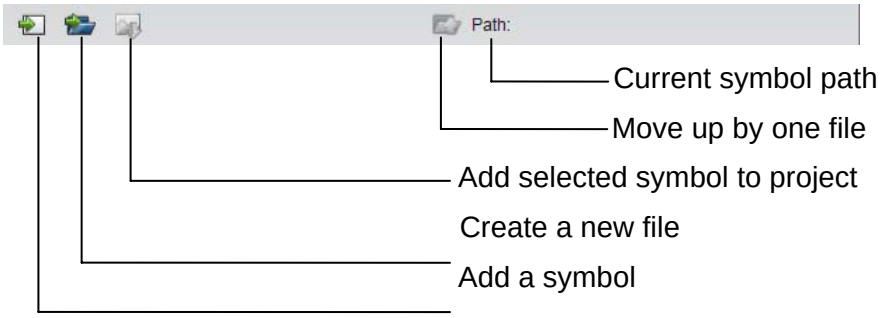
The toolbar offers the following options:




Example: Add an image file to the project

Click onto the button "Add symbol" in the Feet Tab "Symbols":

Subsequently, a dialogue is opened for selecting one or more image files (.BMP). The selected files are copied into the project file, if it does not yet exist here.

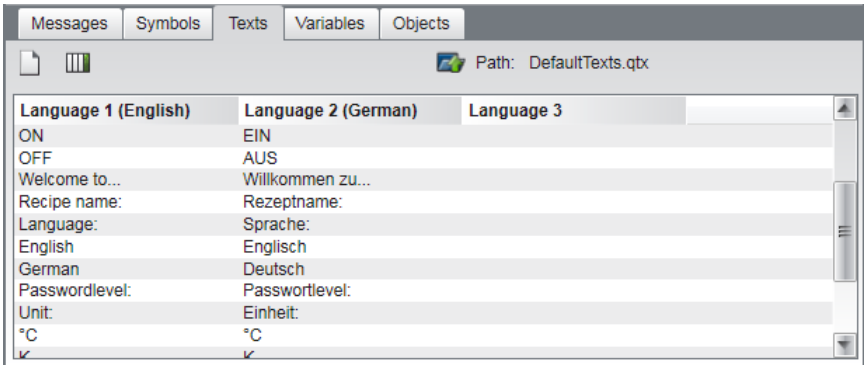
### 3.4.3 Texts

In the Feet Tab Texts, you can create, view and edit texts.

**Note:**

Line breaks are not automatic. However, via "/n" you can force one at any given place.

Texts are stored in lists. The standard text list is the text list DefaultText.qtx. This list is automatically generated and opened when a new project is created. You can recognize an open text list, amongst others, by the path:





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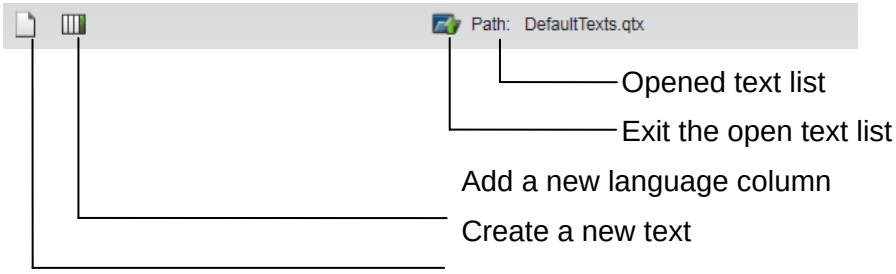
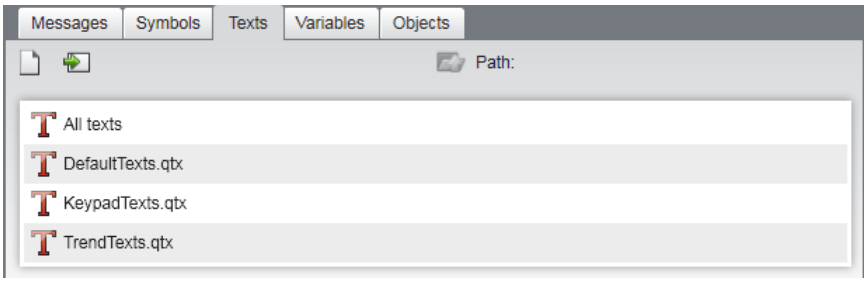
Within an open text list, the toolbar offers the following options:




**Note:**

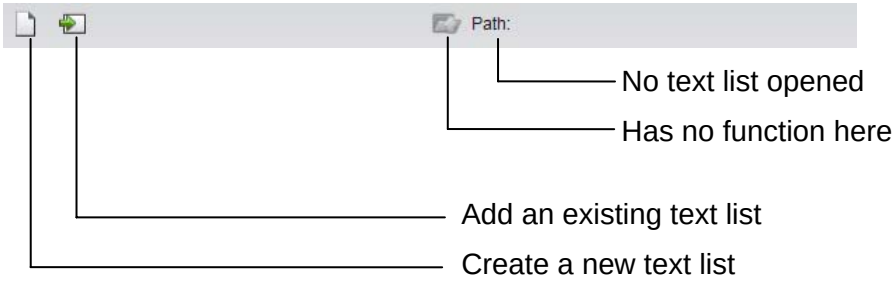
Creating the list, adding a further language or having a list translated by external personnel is possible with the aid of an Excel table (see 4.4.2).

When you exit an open text list and thus close the text, you see a list displaying the existing text list and a list entitled "All texts," containing all texts:




By double-clicking onto a list, it is opened. No texts can be added to the list "All texts."

The toolbar offers the following options:





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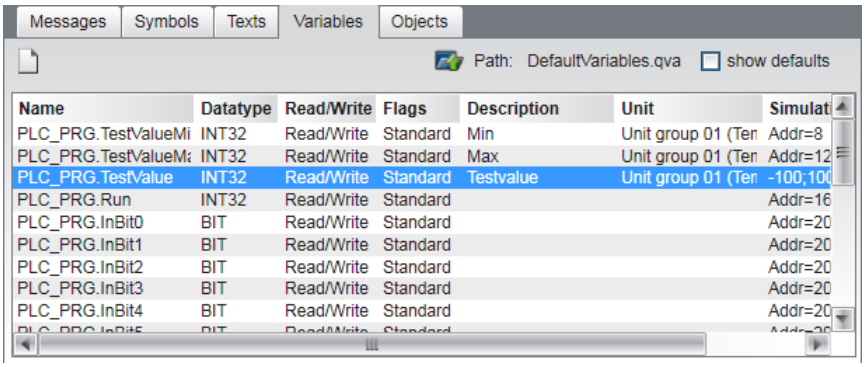
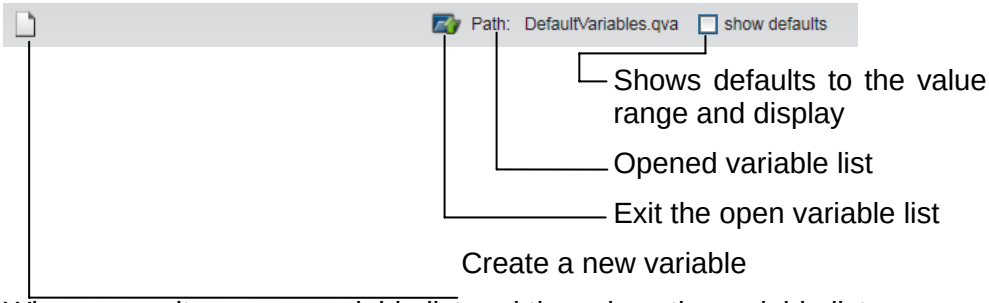
### 3.4.4 Variables

In the Feet Tab "Variables," you can create, view and edit variables.

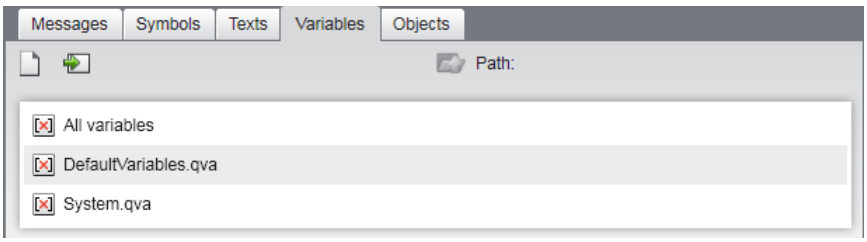
Variables are stored in lists. The standard variable list is the variable list DefaultVariables.qva. This list is automatically generated and opened when a new project is created. You can recognize an open variable list, amongst others, by the path:




Within an open variable list, the toolbar offers the following options:

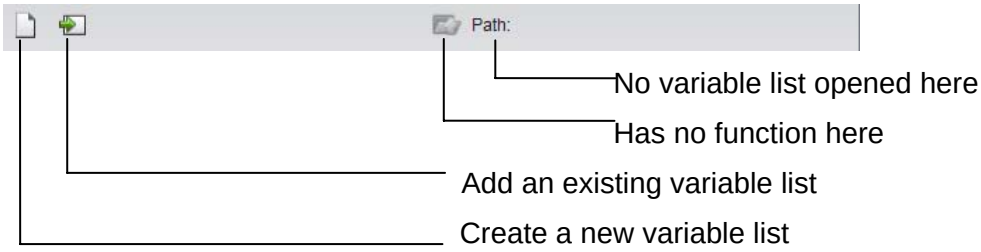

Path: DefaultVariables.qva
show defaults
Shows defaults to the value range and display
Opened variable list
Exit the open variable list
Create a new variable

When you exit an open variable list and thus close the variable list, you see a list displaying the existing variable lists and a list entitled "All variables," containing all variables:




By double-clicking onto a list, it is opened. No variables can be added to the list "All variables."

The toolbar offers the following options:





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### 3.4.4.1 Properties of a Variable

| | |
|---|---|
| Name: | Name of the variable, the variable is referenced in other places in QViS on the basis of this name |
| Data type: | Data type, supported data types:<br>BIT<br>INT8, UINT8,<br>INT16, UINT16,<br>INT32, UINT32,<br>REAL,<br>STRING<br>TIME (UINT32 with the number of milliseconds since 00:00)<br>DATE (UINT32 with the number of seconds since 1.1.1970) |
| Read/Write: | In the case of Read/Write variables, a specific keypad is opened so that the variable can be written. In ReadOnly variable, this is not the case. |
| Flags: | Here you can declare a variable to be "Standard," "Alarm" or "Local."<br>Standard: Variables in the process that are exclusively used for input and output.<br>Alarm: Variables in the process that are continuously read may trigger an event when changed to a non-zero value, which can lead to entries in the alarm list and alarm history list.<br>Local: Variable for purely internal use of QViSRT. |

**Note:**

Local variables are stored in a file and are read in from there when QViSRT is rebooted.

Local variables therefore require an address allocation that, as of QViS V3, can only be set via the simulation address.

Pay heed that each local variable is allocated its own simulation address. The next free simulation address is dependent upon the length of the previous data type.

**Note:**

Local variables can be used, e.g., to display values on a different page than the one where a user entered them.

When storing recipes, e.g., it is thus possible to store a freely editable test with the recipe.

| | |
|---|---|
| Alarm class: | The alarm class for alarm variables are set here. Each alarm variable belongs to a class. |
| Variable to store: | For alarm variables, you can (optional setting) enter a variable here. If the alarm is active, the value of |


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| | |
|---|---|
| | this variable is logged and can be displayed in the alarm list (e.g.: For the alarm "TemperatureTooHigh," the value for "Temperature" should also be logged. |
| Help number: | A help number can be assigned to an alarm. |
| Description: | Optional description text, is used at certain places (e.g., element Variable List). |
| Unit: | Unit as a description text, when "Use base unit" is selected, you can select a unit group (Unit group 00 - 31) |
| Simulation: | You can enter simulation values here. Note: Simulating values does not function for all communication drivers. |
| Multiplier: | During runtime, the value of the variable set here is multiplied with the set Multiplier ("scaled"). If the Multiplier is 1, the value remains unchanged. If the Multiplier value is 0.1, the variable value is multiplied with 0.1. Not every value is allowed to be a<br>Multiplier, e.g., the value may not exceed 1. Typical values are 0.1 0-01, 0.001, etc. |
| Min value: | The minimum value is used for the keypad. An input falling below this value is prevented. The value can either be fixed or linked to a variable. |
| Max value: | The maximum value is used for the keypad. An input exceeding this value is prevented. The value can either be fixed or linked to a variable. |
| Default value: | The default value can be used by certain functions, e.g. the function "set to default". QViS does not initialize the variable (!) with this value. |


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### 3.4.4.2 Systems Variables

Certain variables are already reserved by QViS. They are set by QViS (e.g., the current page number is saved as a variable) or must be correctly used for certain functions (e.g., to change the date, a specific system variable is written).

These variables are called systems variables and are declared in the file "System.qva". When a new project is created, the variable list System.qva is automatically generated. Each variable serves a specific purpose:

| Name | Description | Type | Re-tain |
|---|---|---|---|
| SYS_ActualDate | Current date | Read/Write | |
| SYS_ActualTime | Current time | Read/Write | |
| SYS_AlarmHistExportPath | Path prefix for Alarm History export directory, when specified, this declaration is attached to the registration value "ExportDir" (refer to QViSRT Documentation). | Read/Write | X |
| SYS_AlarmHistExportState | Status of the Alarm History export (1 .. process concluded error-free, 0 .. process is currently being executed, -xxx .. systems error number) | ReadOnly | |
| SYS_Alarms | Number of active alarms | ReadOnly | |
| SYS_AlwaysFalse | Always 0 | ReadOnly | |
| SYS_AlwaysTrue | Always 1 | ReadOnly | |
| SYS_AutoLogoutMinutes | Time interval for automatic log-out, 0 .. no automatic logging out | Read/Write | X |
| SYS_BeeperState | Beeper settings (0 = no beeper, 1 = Beeper for touch function; only functions on special hardware) | Read/Write | X |
| SYS_Brightness | Brightness (only functions on special hardware) | Read/Write* | X |
| SYS_ChangePageDuration | Time in milliseconds needed for the last page change. The time is clocked from the time of input until page display is concluded. | ReadOnly | |
| SYS_Contrast | Contrast (only functions on special hardware) | Read/Write* | X |
| SYS_CpuLoad | CPU load (0..100%, -1 means "unknown") | ReadOnly | |
| SYS_DataTransferState | Status display of whether data are currently being read or written<br>0..data ready; 1..busy data reading; 2..busy data writing<br>Is only used by the QClientOPC for recipe | ReadOnly | |


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| | | | |
|---|---|---|---|
| | upload and recipe download | | |
| SYS_HelpContext | Help context (is set on the projected value of the selected element when Help is called up)<br>If dynamic texts are defined for this variable, in this configuration an external help program is provided as a parameter when the external program is called up (e.g.: links for a browser can be defined here) | Read/Write | |
| SYS_HelpMode | Help mode (0..Normal, 1..Help mode active) | Read/Write | |
| SYS_HwBrightness | Internal (only functions on special hardware) | ReadOnly | |
| SYS_HwContrast | Internal (only functions on special hardware | ReadOnly | |
| SYS_InputValueMax | Maximum input value | ReadOnly | |
| SYS_InputValueMin | Minimum input value | ReadOnly | |
| SYS_InputValueNew | Input value | ReadOnly | |
| SYS_InputValueSaved | Old input value | ReadOnly | |
| SYS_InputVarName | Description text (Description) of current input variable | ReadOnly | |
| SYS_InputVarUnit | Unit of the current input variable | ReadOnly | |
| SYS_Language_01_Enable<br>SYS_Language_32_Enable | Enables locking (0) or activation (1) languages<br>Only possible for languages existing in the project (refer to Project Properties, Languages). | Read/Write | X |
| SYS_LanguageNr | Language number (changing this variable triggers a change in languages) | Read/Write | X |
| SYS_LoginLevel | Current Password Level | ReadOnly | |
| SYS_NetworkDHCP | DHCP-Enable (0..inactive, 1..DHCP active) | ReadOnly | |
| SYS_NetworkIpAddress | Network IP address | ReadOnly | |
| SYS_NetworkPassword | Network password; is only used for printing | Read/Write | X |
| SYS_NetworkStdGateway | Network Standard Gateway | ReadOnly | |
| SYS_NetworkSubNetMask | Network subnet mask | ReadOnly | |
| SYS_NetworkUser | Network user name; is only used for printing (only functions on special hardware) | Read/Write | X |


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| | | | |
|---|---|---|---|
| SYS_NewPassword | - (only functions on special hardware) | Read/Write | |
| SYS_OperatingSystem | Operating system as a number<br>0=unknown<br>1=Windows on PC e.g., Windows XP<br>2=Windows CE<br>3=Linux<br>4=rcX | ReadOnly | |
| SYS_PageNrOverlay | Page number of the opened overlay (-1 = no overlay opened) | ReadOnly | |
| SYS_PageNr | Image number of the opened page (changing this variable triggers a page change) | Read/Write | |
| SYS_Password_0 | Password from Level 0 to Password of Level 9 | ReadOnly | X |
| SYS_PrnColor | 0..b/w printer, 1..color printer (only functions on special hardware) | Read/Write | X |
| SYS_PrnOrientation | Paper orientation (0..portrait, 1..landscape) (only functions on special hardware) | Read/Write | X |
| SYS_PrnOutputPath | Printer path (e.g. "COM3: 115200" or \\server-name\printer-name) (only functions on special hardware) | Read/Write | X |
| SYS_PrnPaperSize | Paper format (1..letter, 5..legal, 9..A4, 12..B4, 13..B5) (only functions on special hardware)) | Read/Write | X |
| SYS_PrnPrepareState | Print preparation status when printing from the PLC (0..ready, 1..print preparation active) (only functions on special hardware) | ReadOnly | |
| SYS_PrnQuality | 0..draft, 1..high (only functions on special hardware) | Read/Write | X |
| SYS_PrnState | Printer status (0..printer inactive, 1..active) | ReadOnly | |
| SYS_QViSProjectAuthor | Author from the project description (is transferred as an ASCII string, 4 characters long) | ReadOnly | |
| SYS_QViSProjectDate | Date, when the project was built (is automatically generated) | ReadOnly | |
| SYS_QViSProjectDescription | Description from the project description (is transfered as an ASCII string, 28 characters long) | ReadOnly | |
| SYS_QViSProjectRelease | Release Number (2 for 1.2.3) of the project builder, with which the project was built | ReadOnly | |
| SYS_QViSProjectRevision | Revision Number (3 for 1.2.3) of the project builder, with which the project was built | ReadOnly | |


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| | | | |
|---|---|---|---|
| SYS_QViSProjectTime | Time when the project was built (is automatically generated) | ReadOnly | |
| SYS_QViSProjectVersion | Version Number (1 für 1.2.3) of the project builder, with which the project was built | ReadOnly | |
| SYS_QViSRelease | QViS Release Number (2 für 1.2.3) of the runtime system | ReadOnly | |
| SYS_QViSRevision | QViS Revision Number (3 für 1.2.3) of the runtime system | ReadOnly | |
| SYS_QViSVersion | QViS Version Number (1 für 1.2.3) of the runtime system | ReadOnly | |
| SYS_RandomValue | Random value (is needed, e.g., for Password Level 9). This random value changes in the same time interval as the validity of Password Level 9 (duration of validity). | ReadOnly | |
| SYS_RecipeDate | | | |
| SYS_RecipeGroup-LastDownloaded | Group name of the last recipe loaded in the machine | ReadOnly | X |
| SYS_RecipeGroup | Group name of the open recipe | Read/Write | |
| SYS_RecipeName | File name of the open recipe | Read/Write | |
| SYS_RecipeName-LastDownloaded | File name of the last recipe loaded in the machine | ReadOnly | X |
| SYS_RecipePath | Path prefix for the recipe path | Read/Write | X |
| SYS_RecipeState | Status of opening or storing recipes (1 .. process concluded error-free, 0 .. process is currently being executed, -xxx .. systems error number) | ReadOnly | |
| SYS_RecipeTime | Time of the opened recipe | ReadOnly | |
| SYS_RemoteState | Remote operation (0..local, 1..remote) (only functions on special hardware) | Read/Write | |
| SYS_ScreenOffMinutes | Time interval for screen off. (only functions on special hardware under Windows CE) | Read/Write | X |
| SYS_ServerEnable | PLC server (1), PLC client (0) (only functions on special hardware) | ReadOnly | |
| SYS_ShiftStatus | State of the shift key (1..shift active, 0..not active) | Read/Write | |
| SYS_SystemStatus | QViS Status (1 = OK, currently the same value = 1) | ReadOnly | |
| SYS_SystemVersion | Operating system/Firmware Description of version (string, string length: 32) | ReadOnly | |
| SYS_Temperature | Temperature of the display (only functions | ReadOnly | |


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| | | | |
|---|---|---|---|
| | on special hardware) | | |
| SYS_TrendExportPath | Path prefix for Trend export directory, when specified, this input is attached to the registration value "ExportDir" (refer to QViSRT Documentation). | Read/Write | X |
| SYS_TrendExportState | Status of the trend data export (1 .. process concluded error-free, 0 .. process is currently being executed, -xxx .. systems error number | ReadOnly | |
| SYS_TrendInterval_1-8 | Logging interval for Trend. (0..0.1s, 1..0.5s, 2..1s, 3..5s, 4..10s, 5..1min, 6..30min, 7..1h) | Read/Write | |
| SYS_TrendMax_1-8 | Maximum value | Read/Write | |
| SYS_TrendMax_9-12 | Maximum value (only for line diagrams) | Read/Write | |
| SYS_TrendMaxDisp_1-8 | y value for the maximum value in percent of the Trend window height (from below) | Read/Write | |
| SYS_TrendMaxDisp_9-12 | y value for the maximum value in percent of the line diagram window height (from below) | Read/Write | |
| SYS_TrendMin_1-8 | Minimum value | Read/Write | |
| SYS_TrendMin_9-12 | Minimum value (only for line diagrams | Read/Write | |
| SYS_TrendMinDisp_1-8 | y value for the minimum value in percent of the Trend window height (from below) | Read/Write | |
| SYS_TrendMinDisp_9-12 | y value for the minimum value in percent of the line diagram window height (from below) | Read/Write | |
| SYS_TrendSetupGroup | Group for setting up or storing Trend setting files. Is only used when configured. | Read/Write | X |
| SYS_TrendSetupName | Name of the set up file with Trend settings, or name of the file with which the function "trend setup save" is to be saved | Read/Write | X |
| SYS_TrendShow_1-8 | Display (0..hidden, 1..unhidden) | Read/Write | |
| SYS_TrendShow_9-12 | Display (0..hidden, 1..unhidden) (only for line diagram) | Read/Write | |
| SYS_TrendState | Trend status (0..logging off, 1..logging simple, 2..logging infinite) | Read/Write | |
| SYS_TrendTotalDays | Max. logging duration (days) | ReadOnly | |
| SYS_TrendTotalHours | Max. logging duration (hours) | ReadOnly | |
| SYS_TrendTotalMinutes | Max. logging duration (minutes) | ReadOnly | |
| SYS_TrendUnits_1-12 | Unit (only for line diagram) | ReadOnly | |
| SYS_TrendValue_1-12 | Value of the variables (only for line | ReadOnly | |


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| | | | |
|---|---|---|---|
| | diagram) | | |
| SYS_TrendVar_1-8 | Description of the Trend variables | Read/Write | |
| SYS_TrendVar_9-12 | Description of the line diagram variables | Read/Write | |
| SYS_Unit_0-31 | Active unit of the unit group 0-31 | Read/Write | X |

* Are Read/Write types, but can only be changed with a function, and not via the numeric input.

During runtime, QViSRT cyclically copies all systems variables with the property Retain as a file in a directory. If this directory retains its files when the target system is rebooted, these variables also retain their values after a reboot


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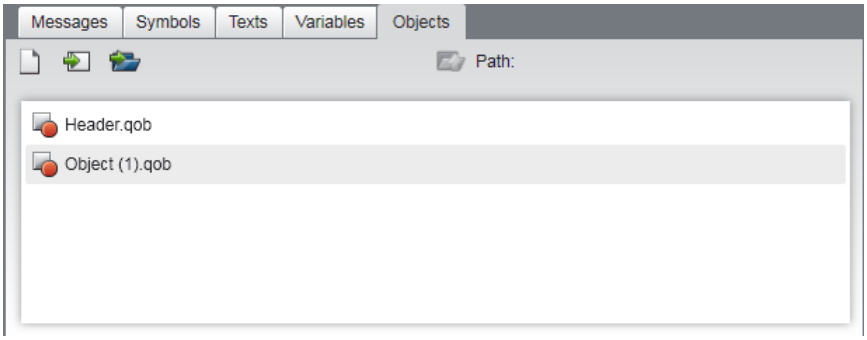
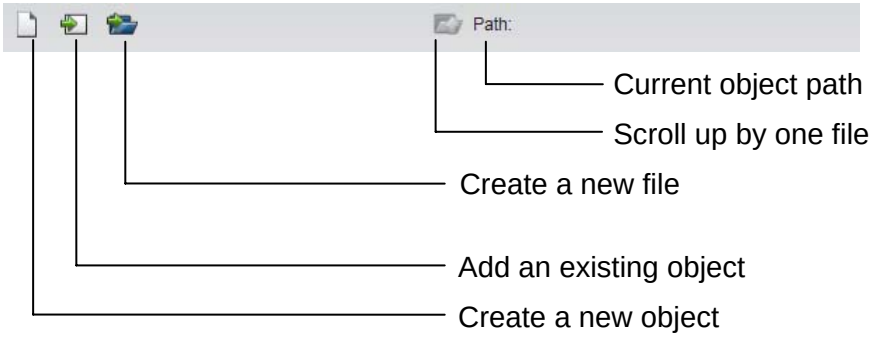
### 3.4.5 Objects



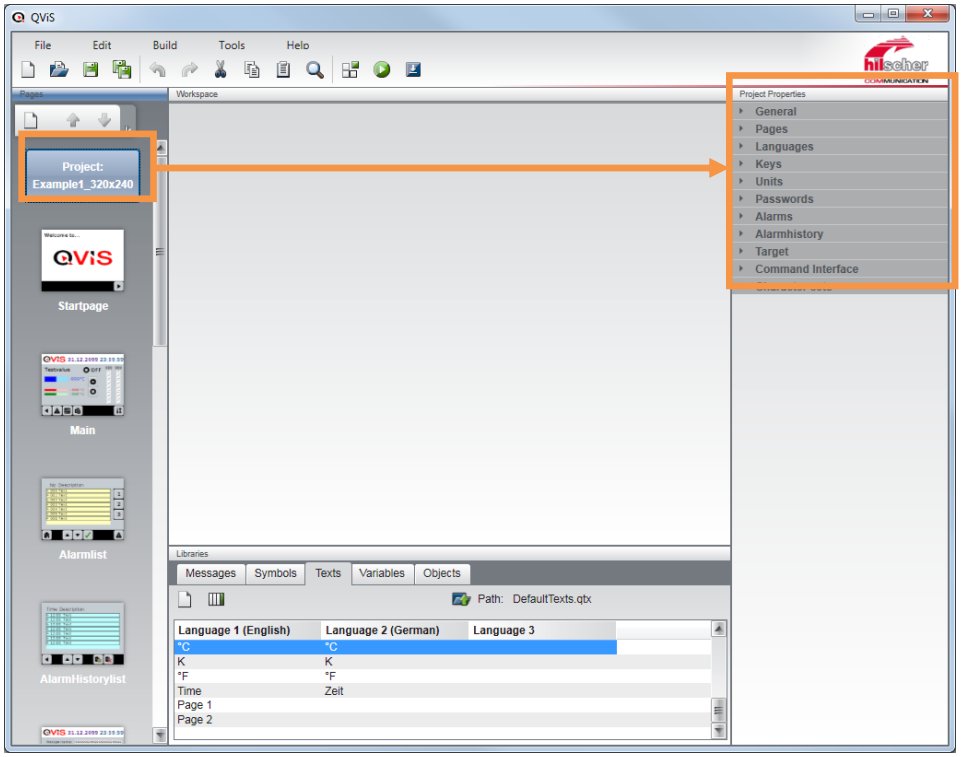

In the Feet Tab "Objects," you can add, view, delete objects; or open them for editing.

The toolbar offers the following options:




## 3.5 Project Settings

When the project name (first entry in the list) is selected in the page browser, the project settings are opened on the right in the Properties area:





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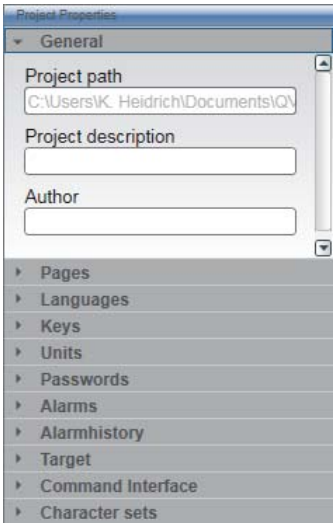
### 3.5.1 General

Under "General," general information is provided on the project.




| | |
|---|---|
| Project path: | Path where the project files are located |
| Project description: | Optional description of the project (28 characters, max.) |
| Author: | Author's initials (four characters, max.) |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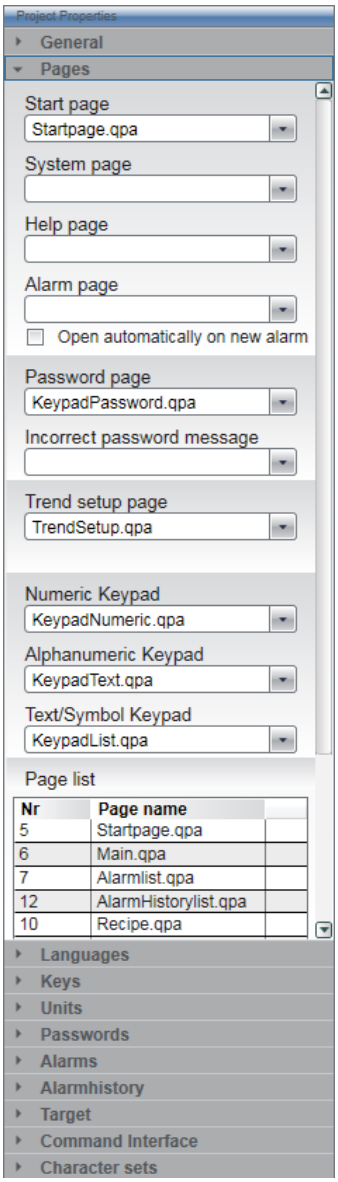
## 3.5.2 Pages

Under "Pages," all pages in the project are listed and global settings performed, which are most often linked to systems functionalities (e.g., defining the start page or the page for alphanumeric input)




Startpage: Start page, QViSRT displays this first following the Start

System page: System page, this page is used by certain functions, e.g., the function "change to system page"

**Note:**

The system page is no longer relevant in current devices, and is only listed for compatibility reasons.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| | |
|---|---|
| Help page: | Help page – The help page is opened when the user clicks onto an object or element with help context (non-zero 0) in the help mode. The help mode can be reached by setting the system variable SYS_HelpMode to 1. |
| Alarm page: | Alarm page |
| Open automatically on new alarms: | When this option is activated, the page automatically switches to the alarm page in the case of new alarms. |
| Password page: | Page for entering passwords |
| Incorrect password page: | Page that opens as an overlay when an unknown password has been entered. |
| Trend setup page: | Page for Trend settings (this entry is hidden when Trend functionality is deactivated) |
| Numeric keypad: | Page for numeric input |
| Alphanumeric keypad: | Page for alphanumeric input (text input) |
| Text/Symbol keypad: | Page for selecting dynamic texts/symbols |
| Page list | Each page has a number, which can be edited here. This number is used by certain functions. |


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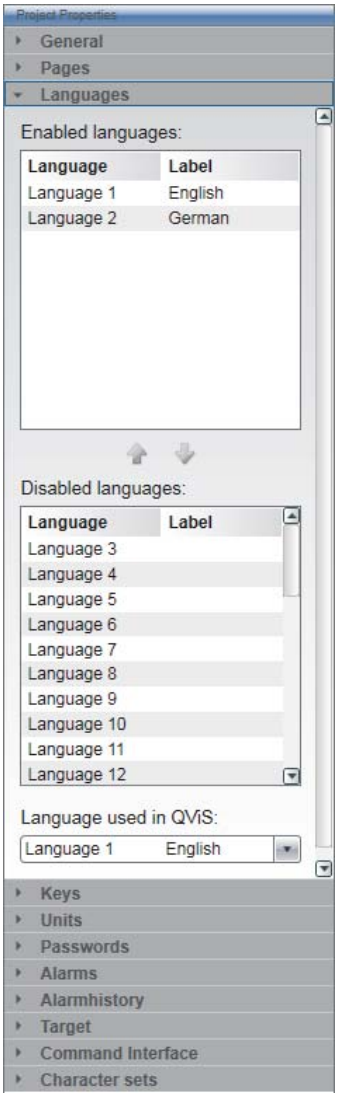
### 3.5.3 Languages

Under "Languages," you will find the list of languages used. Languages can be added or removed. Furthermore, the default language is set here.




Here you set which languages are possible, and which are not. This setting can be important when the target device does not have much storage capacity. Each language can be provided with a name (label). This label is only an internal name for the project planning time, and cannot be seen on the target device.

In the ComboBox "Language used in QViS," you can set which language QViS is to use in the display.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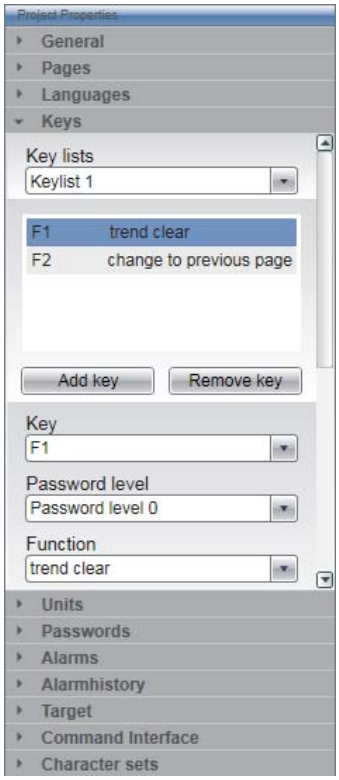
## 3.5.4 Key Lists

Under "Key lists" you can edit the individual key lists. A key list is comprised of a list of keys, whereby each key fulfills a specific function.




| | |
|---|---|
| Key lists: | Select the key lists to be edited |
| Add/Remove key: | Add or remove a key from the list |
| Key: | The key to be edited |
| Password level: | The password level needed by the user to perform the function |
| Function: | Function that is to be performed when the key is pressed.<br>The list of possible functions is described in the chapter Element Button |

Depending on the function selected, additional parameters are displayed, which must be parameterized within the context of the function.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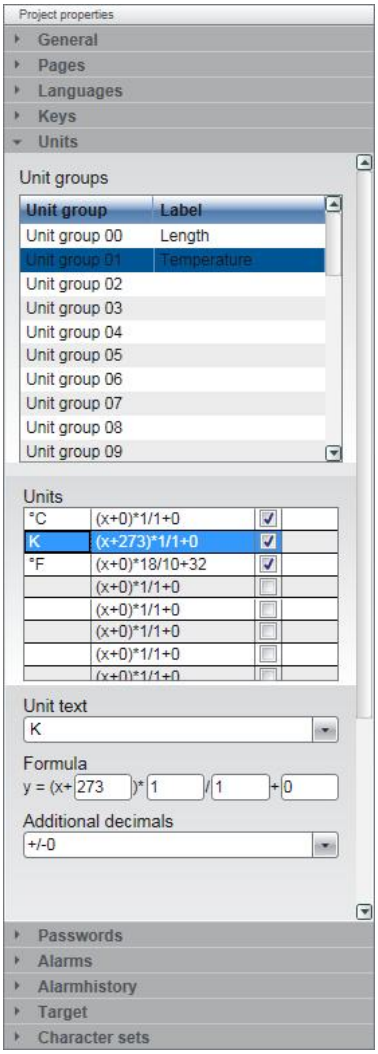
### 3.5.5 Units

Under, "Units" you can create various unit groups. Via the unit groups, e.g., it is possible to toggle between °C and Kelvin over the entire project.




Each variable can be assigned to a Unit group. The variable "TemperaturHot," e.g., of the "Unit group 01." Each Unit group can have up to eight Unit, e.g., degrees Celsius, Kelvin, degrees Fahrenheit. These Units and their conversion can be defined here.

Each Unit group can be provided with a label. This label is only an internal name for the project planning time, and cannot be seen on the target device.

| | |
|---|---|
| Unit group: | Select the Unit group |
| Units: | Select the Unit |
| Unit text: | Unit as text (e.g., "°C") |
| Formula: | Conversion formula for this Unit, the value of the variable is converted using this formula; e.g., for Kelvin: value in °C + 273 |
| Additional decimals: | Additional decimals for this Sub-unit |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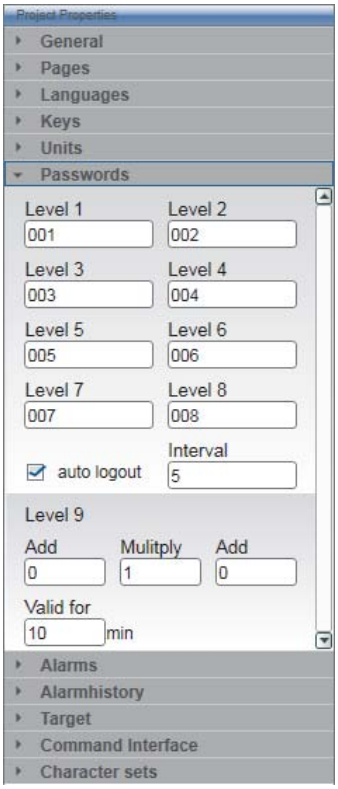
### 3.5.6 Passwords

You can prevent the undesired input or operation with a password. Input is only possible after entering a valid password.




Level 1 to 8: Passwords for Password Levels 1 to 8 are defined here

auto logout: If this option is activated, automatic logout is activated.

interval: Here you can define a time interval in minutes. Should no operations take place during this period, an auto logout is performed (User Level 0). This time interval is an initialization value and can be dynamically modified during runtime via a systems variable. The value 0 deactivates this function (no automatic logout).

Level 9: The password for Level 9 is dependent on the random value generated by the system (SYS_RandomValue). This value is changed at the stipulated interval for password validity ("valid for") in the range of 0 to 9999. The password for Level 9 is then defined via a conversion formula e.g.:
SYS_RandomValue = 1234
Password = ((1234 + 100) * 3) - 200 = 3802.

Application example for Password Level 9:

Mr. A would like to change a value with User Level 9. He reads a random value on the display and informs Mr. B of the value. Mr. B knows the conversion formula and gives Mr. A the password. Mr. A has, e.g., access to User Level 9 for 10 minutes.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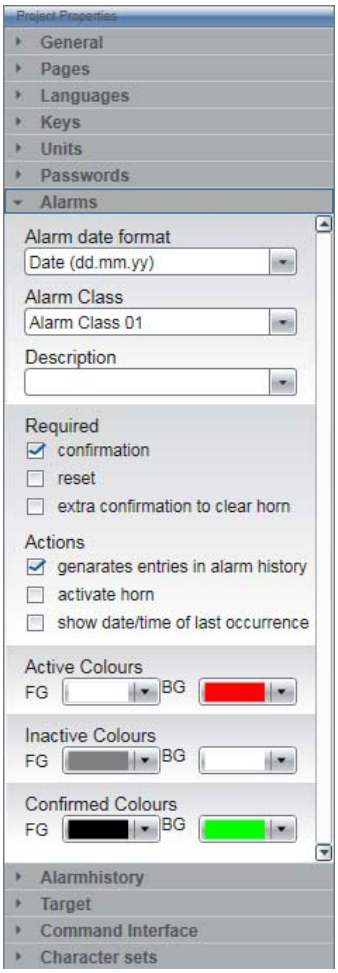
### 3.5.7 Alarms

Alarms are special events that due to variable values, result in entries in alarm lists and/or the alarm history list. These variables are continuously read, and an event is triggered when the value changes to a non-zero value. Thus, a byte, integer, etc., can trigger an alarm event.

All alarms are primarily logged in the alarm list, whereby each alarm is only displayed once with its current status.

Alarm classes provide for grouping alarm properties such as description texts, confirmations and colored displays.




Alarm date format: Defines the date format for all alarm lists

Alarm class: Here you select the alarm classes to be edited

Description: Optional description of an alarm class

Required confirmation: Alarms of this class are not deleted from an alarm list until this is confirmed

Required reset: Unconfirmed alarms of this class are not removed from the alarm list until a reset has been performed. Confirmation (alarm confirm) is not sufficient.

Required extra confirmation to clear horn:
Alarms of this class require the initial confirmation to deactivate the horn.

Generate entries in alarm history:
Alarms of the class generate an entry in the alarm history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Activate horn: Alarm activate horns (e.g., beepers); only possible when supported by the hardware.

Show date/time of last occurrence:
For this class, the current date and time is always entered when an alarm occurs. Additionally, these entries are moved to the end of the list (chronological display).

Colors: The colors for the individual alarm statuses are defined here. An alarm in an alarm list is displayed with this color.

**Note:**

It is sensible to use Boolean variables as alarms. However, other data types may also be used. In this case, it must be taken into consideration that an alarm is only in the queue/true, when the value of its assigned variable is non-zero.


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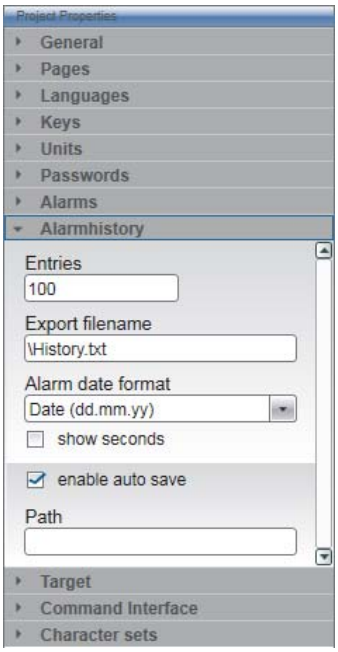
## 3.5.8 Alarm History

All alarms are primarily logged in the alarm list, whereby each alarm is only displayed once with its current status.

You can supplement the alarm history by creating one entry per alarm event (Alarm coming) in order to log the chronological history.

The alarm history can survive a power outage, provided that it is parameterized. Moreover, an ASCII file can be generated containing the following information, which people can interpret.




| | |
|---|---|
| Entries: | Maximum number of entries |
| Export filename: | Name of the export file under which the alarm history is exported by means of the export function that can be parameterized via a button. The export function generates an interpretable ASCII file that can be opened with any given text editor.<br><br>If a path has been specified, and it does not exist, the respective directory is automatically generated.<br><br>Attention: The default path, which is dependent on the HMI device stipulated in the QViSRT.cfg of the device (Key: AlarmHistoryDir=) is supplemented by the relative path defined here. . |
| Alarm date format: | Defines the date format in the alarm history |
| show seconds: | Activates the display of seconds |
| enable auto save: | Activates the automatic storage of the alarm history in file that runtime can interpret. This file is independent of the export file (see above) and ensures that the alarm |
| Path: | Relative path declaration where the AutoSave file is saved. If the directory does not exist, it will be |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generated. The absolute path is derived from the key "AlarmHistoryDir" in QViSRT.cfg of the HMI device and the relative component defined here.

Generally speaking, this path input can remain empty.

**Note:**

Depending on the operating system under which QViSRT runs, it can be that file systems are used, which adhere to the DOS 8.3 nomenclature. This must be heeded when entering path and file names.

**Note:**

By changing the QViSRT.cfg of the HMI device, all files managed by QViSRT can also be searched for/saved in another place. The alarm history can thus, e.g., be moved from a the default directory to a SD card, should it exist:

- Default for a HMI running under the operating system rcX: AlarmHistoryDir=/SYSVOLUME/QViS
- Necessary change so that an existing SD card is used: AlarmHistoryDir=/SDMMC/QViS

The default paths noted here can deviate under other operating systems such as Windows XP/CE or Linux.


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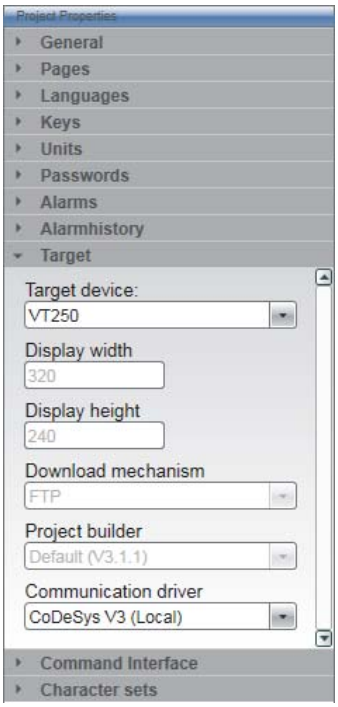
## 3.5.9 Target

Under "Target," device-specific declarations are entered (e.g., display resolution). If a device description has been installed for the device, only the technically possible parameters can be selected.




Target device: Here you enter the target device under which the project is to run. This setting is optional and must not imperatively agree with the actual target device.

Display width, height: Display size of target device in pixel. This size is used, e.g., so that a new (empty) page is automatically created in this size. This setting must not imperatively agree with the actual size of the target system.

Download mechanism: The preferred mechanism for downloading the project to the target system can be set here.

Communication driver: Here you set which communication driver QViSRT uses on the target system. This setting must agree with the communication driver used.

Project builder: A compiler can be entered here. The setting "Default" means that the latest one will be used. For compatibility reasons, e.g., an older compiler can be entered. Depending on the "Target device," selected, the field "Project builder" may also be disabled and unchangeable.

**Note:**

Please refer to the Application Note "QViS Driver Configuration" for further information on setting the communication driver.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## 3.5.10 Command Interface

The "Command Interface" is an interface from QViSRT, for receiving commands (e.g., change page) via the communication driver at the other end (generally a PLC).

Communication is exclusively executed via variables, which is handled via a protocol. These variables are recognized by their names and displayed here.

To ensure that communication functions, a minimum set of variables is necessary.

The protocol can be tunneled via any driver offered, as the function only prerequisites the existence of the respective variable names.

### 3.5.10.1 Executable Commands

The following commands are possible:

| | |
|---|---|
| AlarmsConfirmAll: | PLC ⇨ QViSRT<br>PLC confirm all queued alarms in QViSRT. |
| AlarmHistoryDelete: | PLC ⇨ QViSRT<br>PLC triggers deleting the alarm history in QViSRT. |
| DateSet: | PLC ⇨ QViSRT<br>PLC triggers QViSRT to take over the transmitted date as the systems date. |
| Hello: | PLC ⇨ QViSRT<br>Dummy Message from the PLC; no function |
| HelloToo: | QViSRT ⇨ PLC<br>Dummy Me from QViSRT; no function |
| LanguageSet: | PLC ⇨ QViSRT<br>PLC triggers QViSRT to change to a specific language. |
| LoginOpen: | PLC ⇨ QViSRT<br>PLC triggers QViSRT to open the overlay a user needs entering the password. |
| Logout: | PLC ⇨ QViSRT<br>PLC triggers QViSRT to an automatic and immediate logout. |
| OverlayOpen: | PLC ⇨ QViSRT<br>PLC triggers QViSRT to open the overlay with a specific number. |
| OverlayClose: | PLC ⇨ QViSRT<br>PLC triggers QViSRT to close the overlay with a specific number. |
| PageSet: | PLC ⇨ QViSRT<br>PLC triggers QViSRT to change to a specific page number. |
| PageGetCurrent: | PLC ⇨ QViSRT<br>PLC triggers QViSRT to report which page number is currently being displayed. |


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| | |
|---|---|
| PageCurrentInfo: | QViSRT ⇨ PLC<br>QViSRT reports to PLC which page number is being displayed. |
| RecipeOpenAndDownload: | |
| | PLC ⇨ QViSRT<br>PLC triggers QViSRT to download a recipe with a specific recipe group and specific recipe names from a specific recipe page. |
| RecipeSave: | PLC ⇨ QViSRT<br>PLC triggers QViSRT to store a recipe with a specific recipe group and specific recipe names on a specific recipe page. |
| TimeSet: | PLC ⇨ QViSRT<br>PLC triggers QViSRT to take over the transmitted time as the systems time. |
| TouchOnOff: | PLC ⇨ QViSRT<br>PLC triggers QViSRT to prevent or activate operating via touch. |

**Note:**

Please refer to the Application Note, QViS Command Interface for further information on using this command interface.


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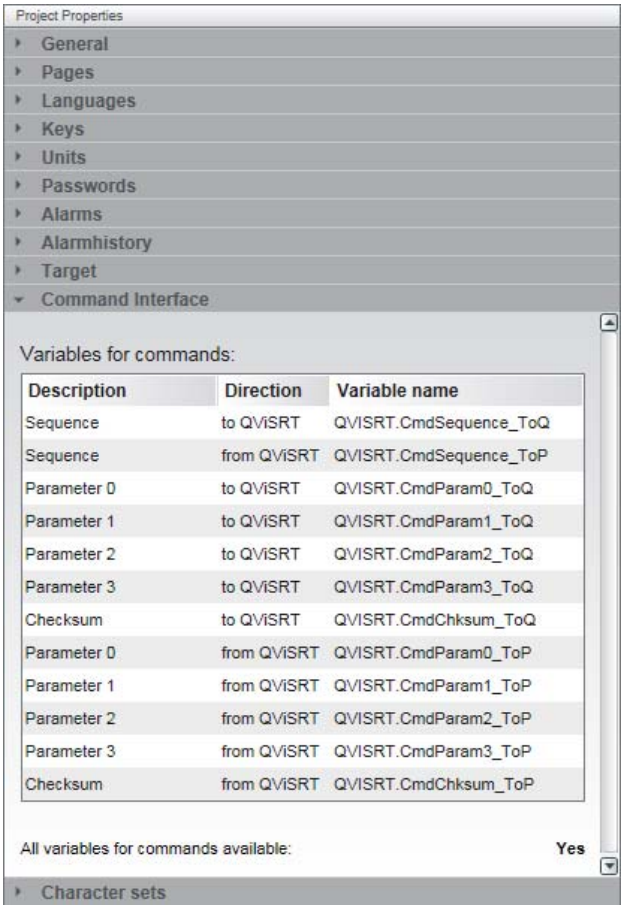
### 3.5.10.2 List of the Necessary Variables




Variables of the Command Interface:

CmdSequence_ToQ:

Contains the sequence number of the PLC in the direction QViS. This number is managed by the PLC page and constitutes an order counter.

CmdSequence_ToP:

Contains the sequence number of the QViSRT in direction PLC. This number is managed by the QViSRT page and constitutes an order counter.

CmdParam0..3_ToQ:

These four variable contain parameters (e.g., function codes) that are transmitted by the PLC in the direction QViSRT.

CmdParam0..3_ToP:

These four variable contain parameters (e.g., function codes) that are transmitted by the QViSRT in the direction PLC.

CmdChksum_ToQ:

The checksum transmitted by QViSRT in the direction PLC determines when an order or response is valid. This mechanism is necessary, because entirely asynchronous protocol processing via variables is possible on any PLC driver.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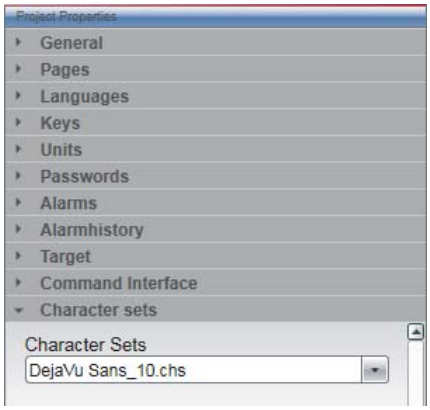
CmdChksum_ToP:

The checksum transmitted by the PLC in the direction QViSRT determines when an order or response is valid. This mechanism is necessary, because entirely asynchronous protocol processing via variables is possible on any PLC driver.

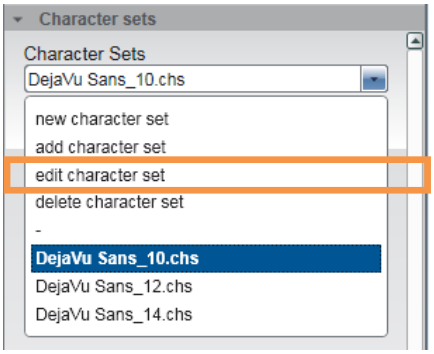
## 3.5.11 Character Sets

Under "Character sets," the existing fonts can be edited in QViS, or new fonts added.




Character Sets: Character Sets (QViS fonts) can be viewed, deleted and created here.

If you wish to modify an existing Character Set, select "edit character set":




The following window will then be opened in the work area: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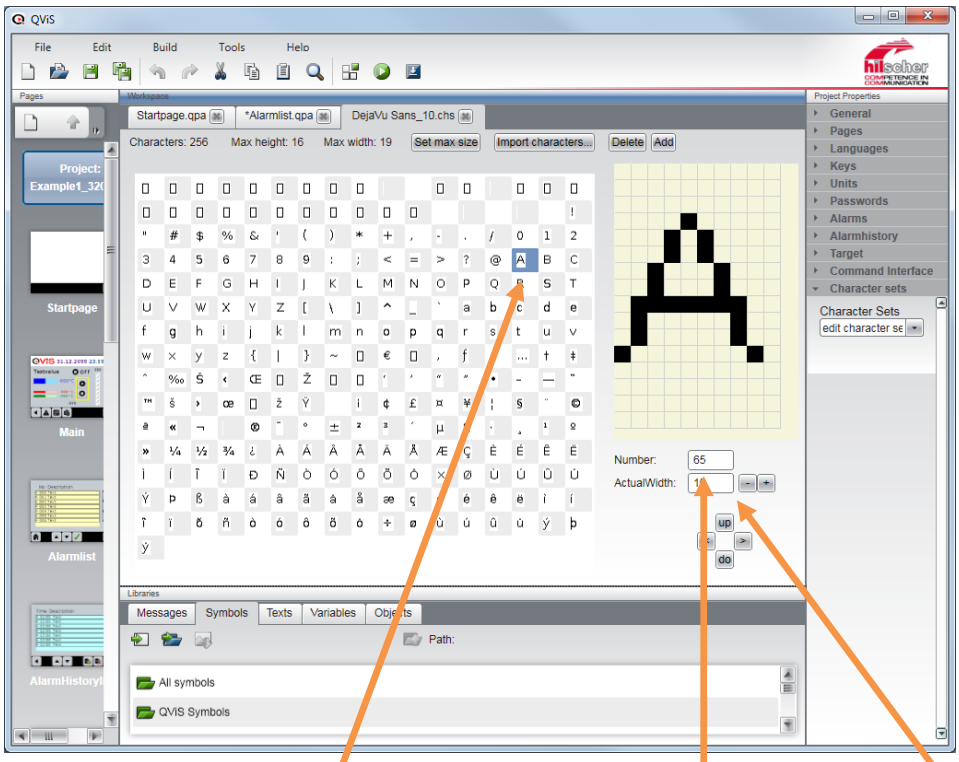
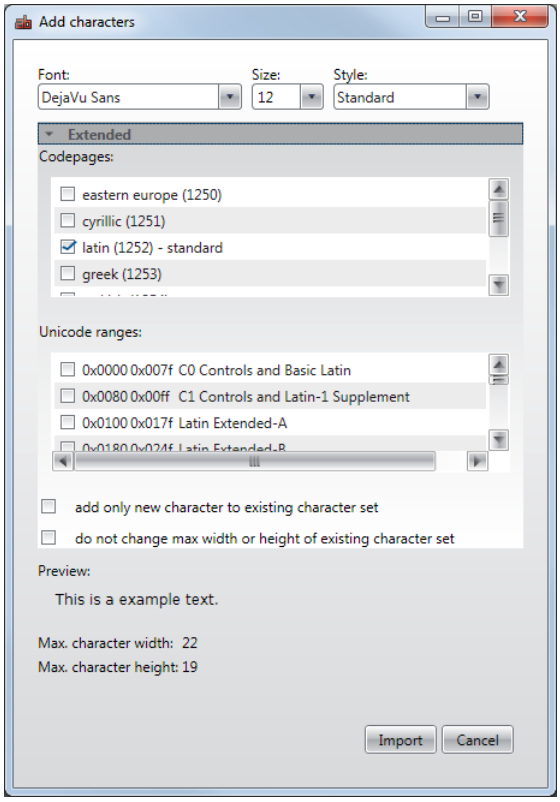



When a character is selected, the number and width can be changed. Individual pixel can also either be set or deleted. By clicking onto the button "Import characters," characters from fonts installed on your PC can be imported:




When you open the expander "Extended." you can choose which characters from the selected font are to be imported.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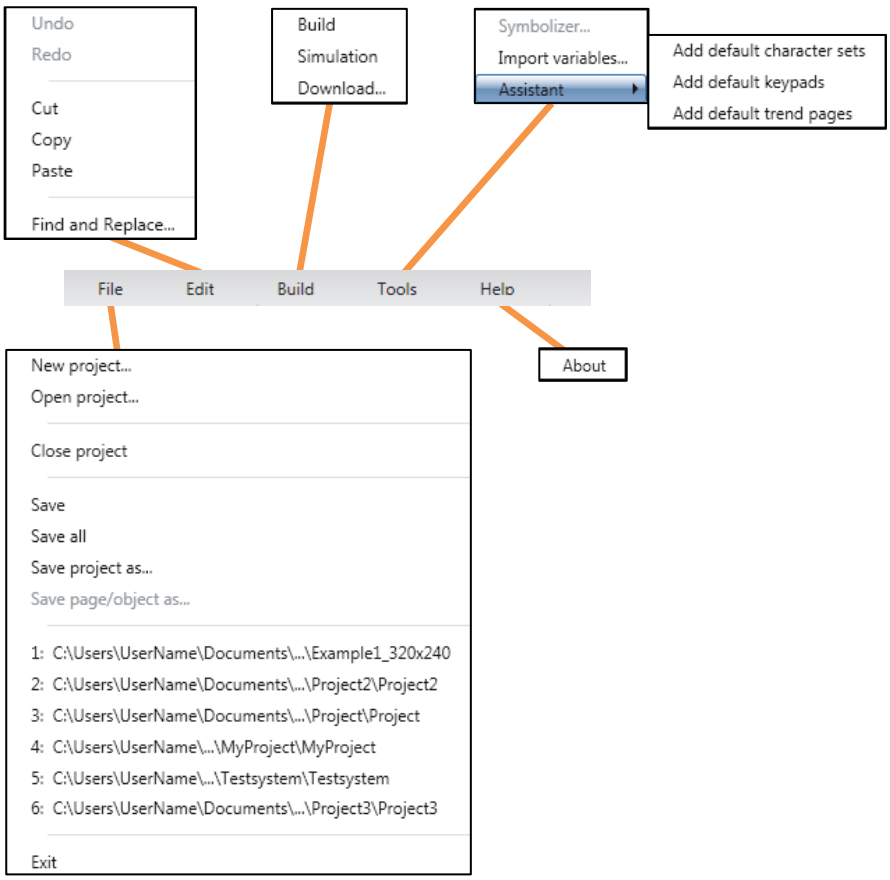
**Note:**

Adhere to the copyright laws and exclusively use fonts whose rights you own, or those that are expressly free.

## 3.6 The Main Menu




| | |
|---|---|
| File, New project: | Generates a new QViS project. |
| File, Open project | Opens an existing QViS project. |
| File, Close project | Closes the current QViS project. |
| File, Save | Stores the selected file (page or object in Workspace or selected Feed Tab) |
| File, Save all | The project and all opened files are saved. |
| File, Save Project as | The entire project can be saved under another name (at another place). |
| File, Save page/object as | Stores the selected area "Workspace" (can either be a page or an object) under a new name. |
| File, 1..n | The most recently opened projects are listed to enable quicker access. |
| File, Exit | Exit ends the application. |
| Edit, Undo | Undo last action. |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| | |
|---|---|
| Edit, Redo | Redo last undo action. |
| Edit, Cut | Cut |
| Edit, Copy | Copy |
| Edit, Paste | Paste |
| Edit, Find and replace | Find and replace, project-wide |
| Build, Build | Build the project. |
| Build, Simulation | Launch the simulation. |
| Build, Download… | Launch the download on the target system. |
| Tools, Symbolizer | Launch the Symbolizer; the Symbolizer is used for importing and creating variables for the most different fieldbus drivers. |
| Tools, Import variables… | Import variables from an XML file. This import is needed when a proprietary QViS driver is to be created. |
| Tools, Assistant | Launch diverse assistants. |
| Help, About | General information on QViS (e.g., Version) |


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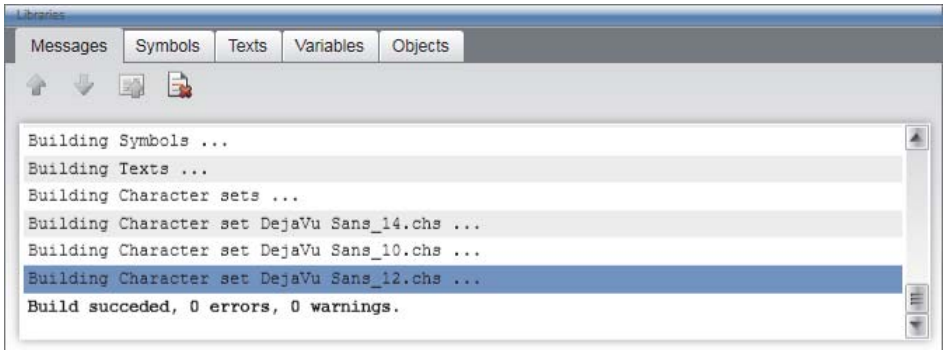
# 3.7 Building the Project

To "play-back" a project created in QViS on the target device, it must first be built. To do so, press the menu item "Build/Build" or the button "Build" in the toolbar:

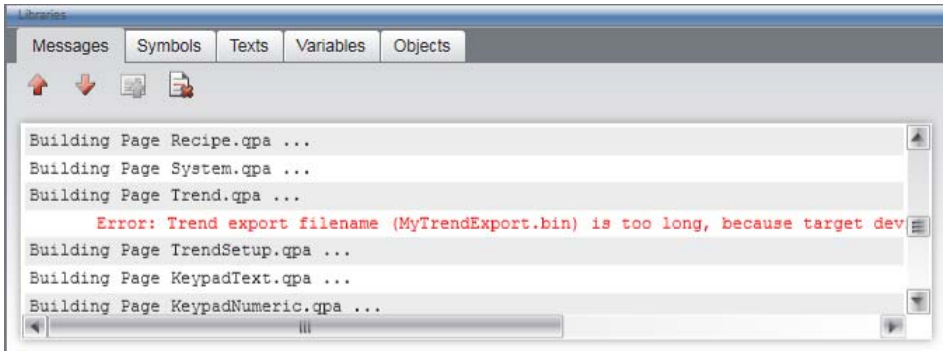
The following steps are run through in "Build":

- The complete project is saved (save all)
- The ProjectBuilder tries to build the project
- The status messages of the ProjectBuilder are displayed in the Feet Tab Messages

When the project has been successfully built, at the end you will receive the message: "Build completed with 0 errors and 0 warnings":




- Errors are marked in red.
- You can jump to the errors by pressing F4.
- In most error cases, you can jump to the error source by double-clicking onto the error message. The page containing the error will be opened.





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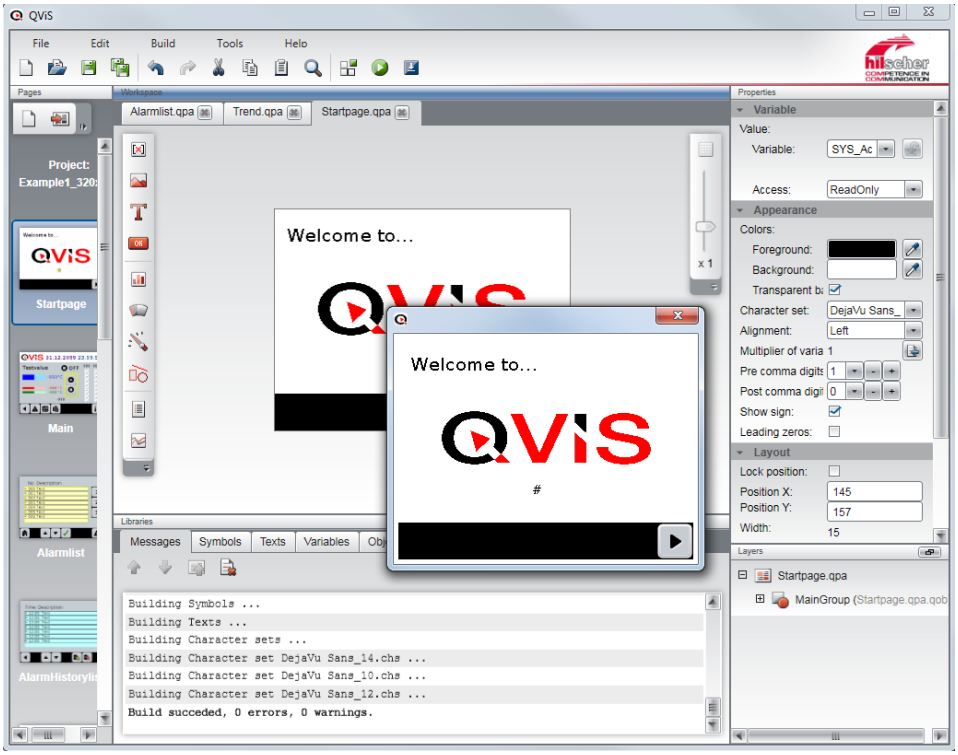
## 3.8 Simulating the Project

Simulation means launching the QViS project directly on the development PC, as if the target device is being simulated in a window.

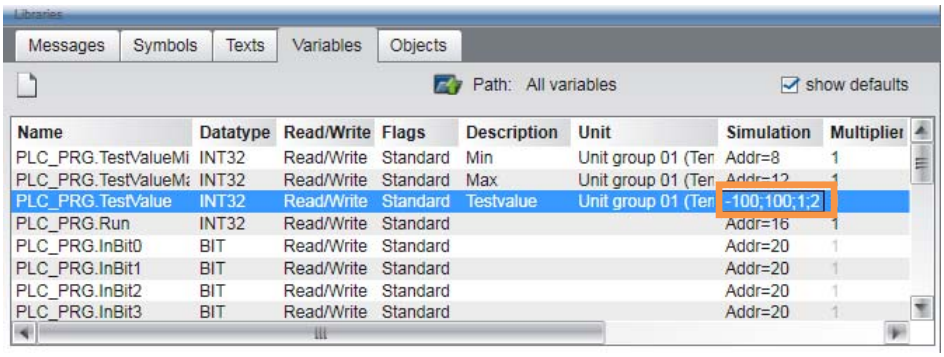
The prerequisite is having successfully built the project. The simulation is then launched by clicking onto the Simulation button in the toolbar:

A window is then opened in which the simulation is run. It is operated similar to the target device. Naturally, not all functions are identical, in particular the hardware-dependent functions such as "increase monitor brightness."

Depending on the set communication driver (project properties, target, communication driver), the variable values are either writable, or not. The setting "Simulation" is suitable for the simulation.




In order that variables can be located on different storage positions, an address can be assigned in the variable declaration in the column "Simulation":





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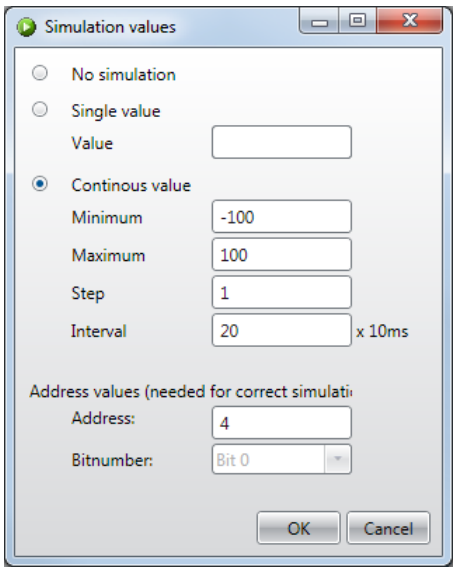


Assign an address so that variables are not at the same storage position, e.g.

Value1, INT32, Address = 0

Value2, INT32, Address = 4

Value3, STRING with string length = 20, Address = 8

Value4, INT8, Address = 28

Value5, INT16, Address = 32


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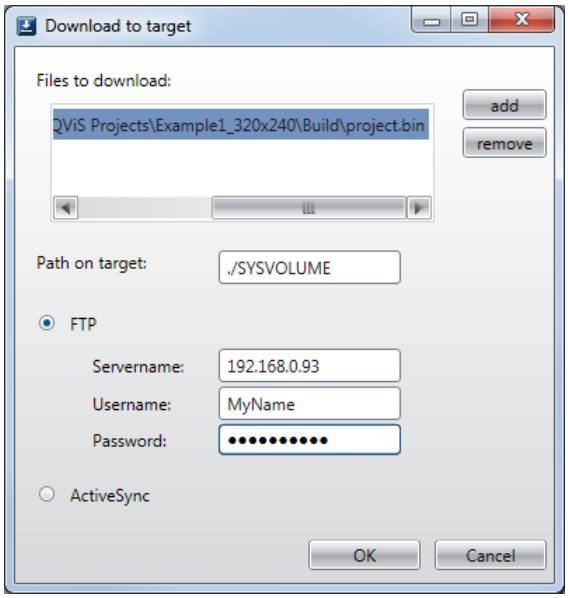
## 3.9 Copying the Project to the Target System

The project built must be copied to the target device. To do so, click onto the Download button in the toolbar:

Subsequently, a download dialogue is opened:

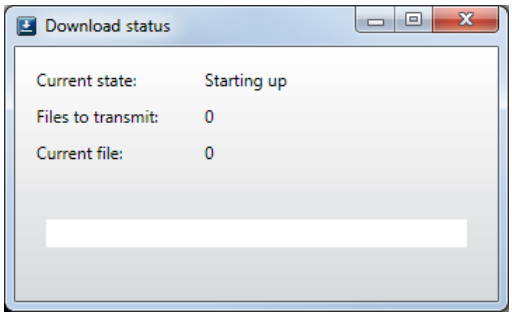



Select the download mechanism and fill out the necessary fields, e.g., for FTP:

- Servername: Name or IP address of the target device
- Username: User name for accessing FTP
- Password: Password for accessing FTP

Depending on the target selected, the target path can be set on the target system under "Path on target".

Subsequently, you click onto OK. Copying to the target device is then launched.




When the download is concluded, a message is displayed on the screen. Depending on the target set, after a successful download, the question is displayed as to whether a reset should be performed on the target.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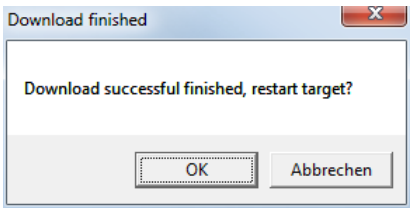
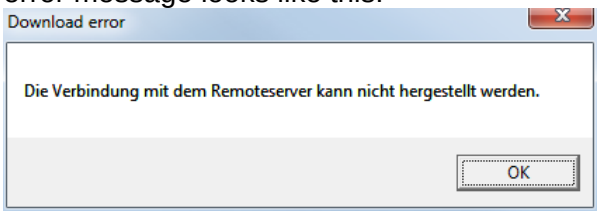
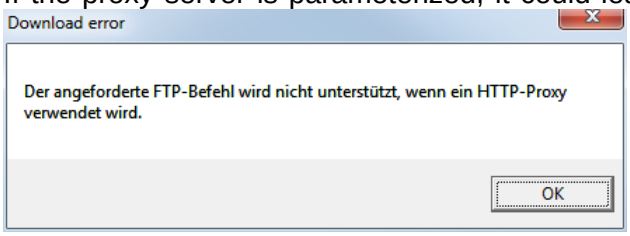



If the download was not successful, various error messages could indicate the cause.

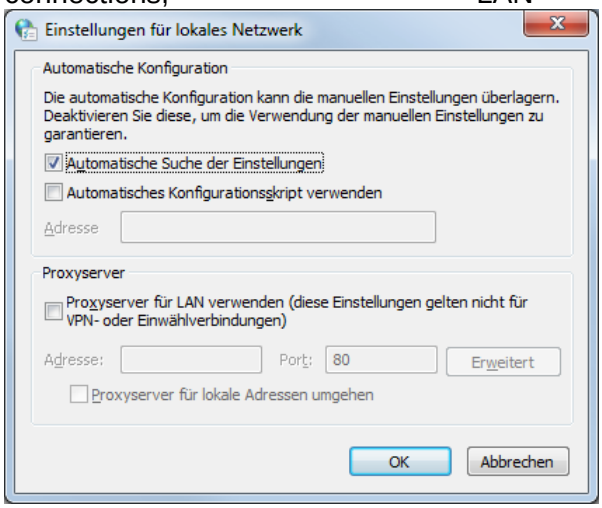
- When, e.g., the FTP server of the target device was not contactable, the error message looks like this:




- If the proxy server is parameterized, it could lead to the following error:




In this case, the proxy server might need to be deactivated in the network settings of the computer (systems control, Internet options, connections, LAN settings.





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# 4 Application Examples

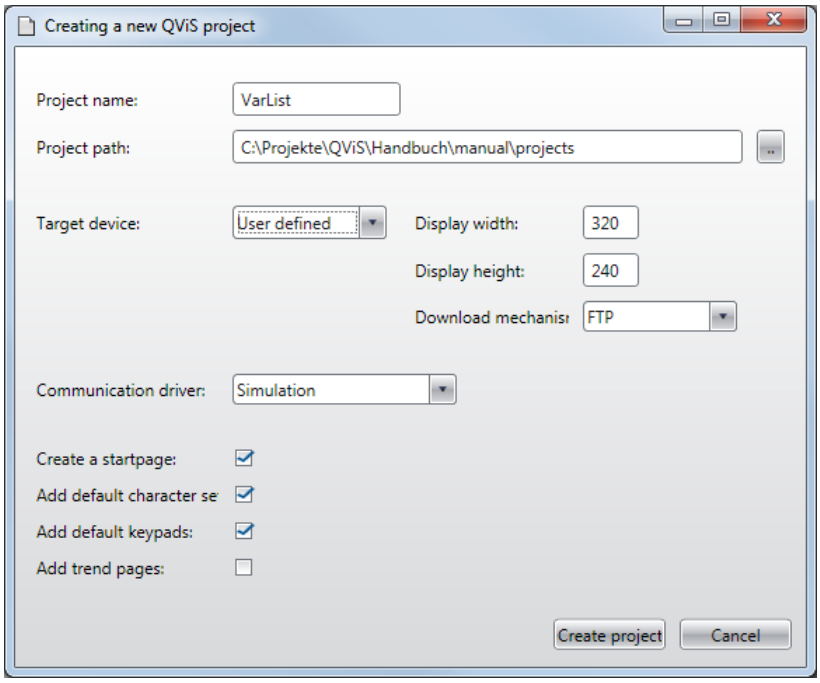
## 4.1 Variable Lists

**Task:**

- 4 variable values are to be displayed in a list.
- The variables are to have different display formats.
- Some variables should be selectable and editable.

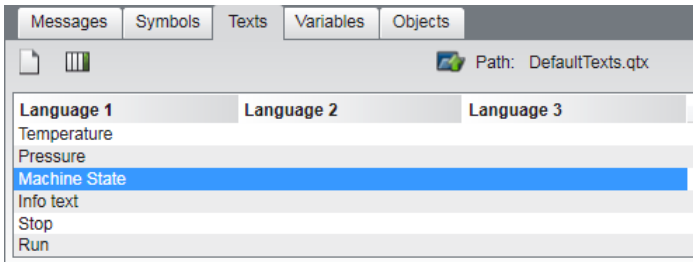
### Step 1: Create a new project

Create a new project (Menu File, New project…) and select the following settings:




### Step 2: Create texts

You now create the following texts:





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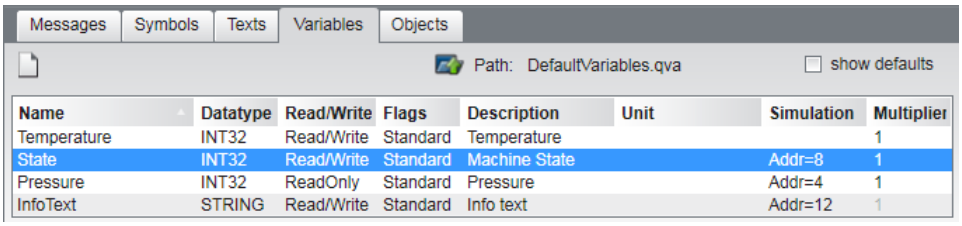
### Step 3: Create variables

Create the following variables:




| Name | Datatype | Read/Write | Flags | Description | Unit | Simulation | Multiplier |
|---|---|---|---|---|---|---|---|
| Temperature | INT32 | Read/Write | Standard | Temperature | | | 1 |
| State | INT32 | Read/Write | Standard | Machine State | | Addr=8 | 1 |
| Pressure | INT32 | ReadOnly | Standard | Pressure | | Addr=4 | 1 |
| InfoText | STRING | Read/Write | Standard | Info text | | Addr=12 | 1 |

| | | |
|---|---|---|
| Temperature: | Data type: | INT32 |
| | Read/Write: | Read/Write |
| | Description: | "Temperature" |
| | Simulation Address: | 0 |
| Pressure: | Data type: | INT32 |
| | Read/Write: | ReadOnly |
| | Description: | "Pressure" |
| | Simulation Address: | 4 |
| State: | Data type: | INT32 |
| | Read/Write: | Read/Write |
| | Description: | "Machine State" |
| | Simulation Address: | 8 |
| InfoText: | Data type: | STRING |
| | Length: | 20 |
| | Read/Write: | Read/Write |
| | Description: | "Info text" |
| | Simulation Address: | 12 |

**Note:**

The setting possibilities for the simulation are restricted, so simulating real is limited. The simulation settings have no influence on other driver settings.

### Step 4: Insert and position the element "List"

The page "Startpage" should already be open, if not, open it by clicking onto the element "List" in the Element List":

Position the element on the start page: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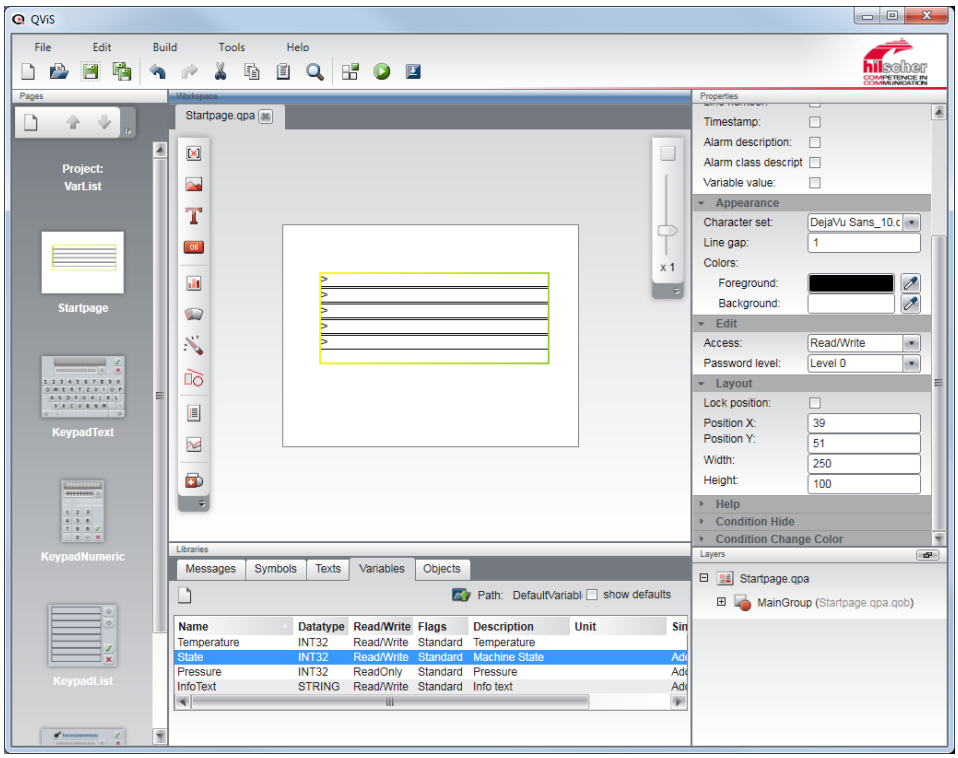
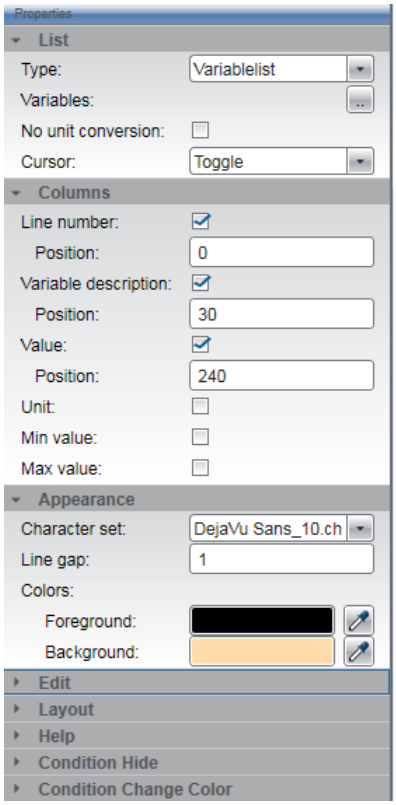



**Step 5: Defining the list's properties:**




| | |
|---|---|
| Type: | Variable list |
| Columns: | Line number, Position = 0<br>Variable description, Position = 30<br>Value, Position = 240 |
| Colors: | Select any colors you wish |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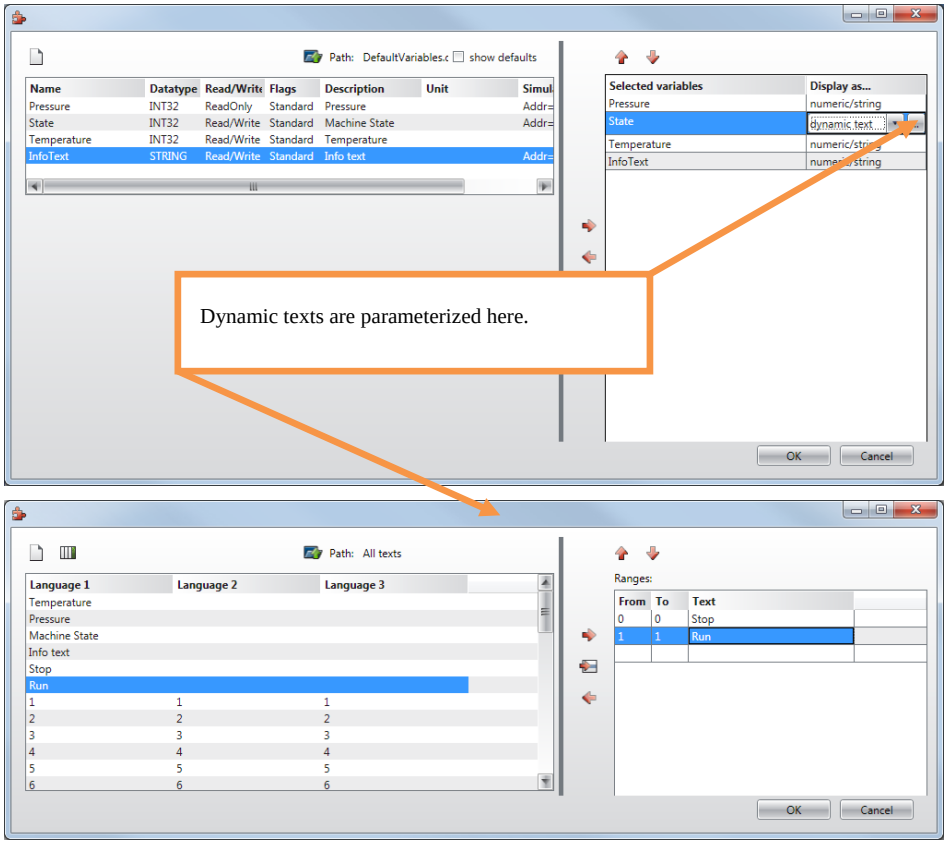
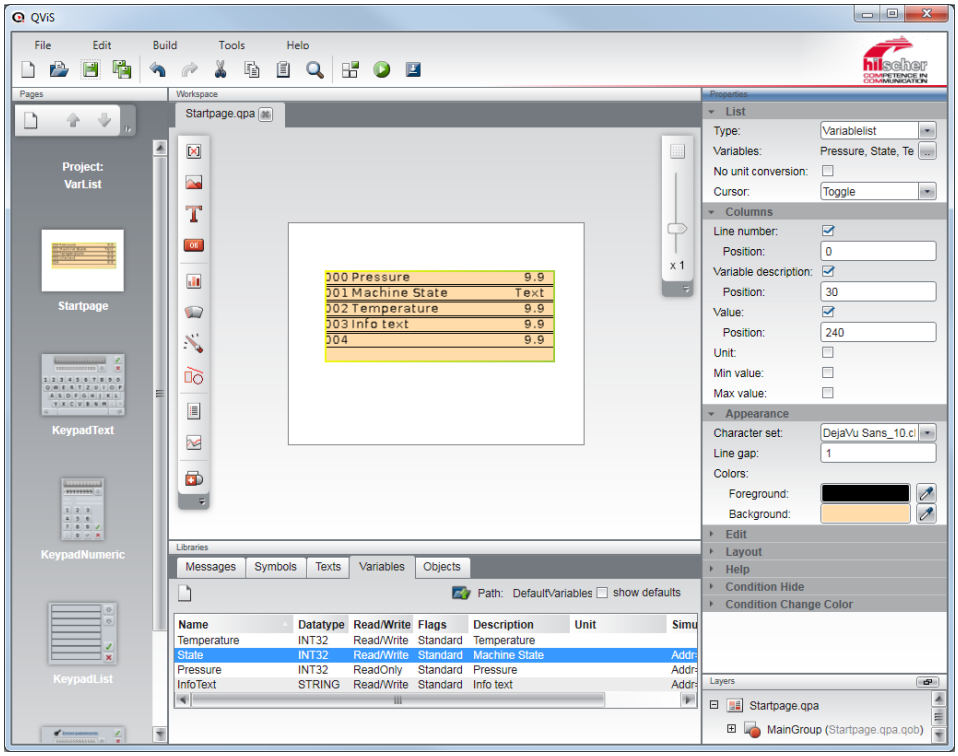
Select the variables, whereby the variable "State" should be a dynamic text:




## Step 6: Build and simulate the project



Build the project and launch the simulation: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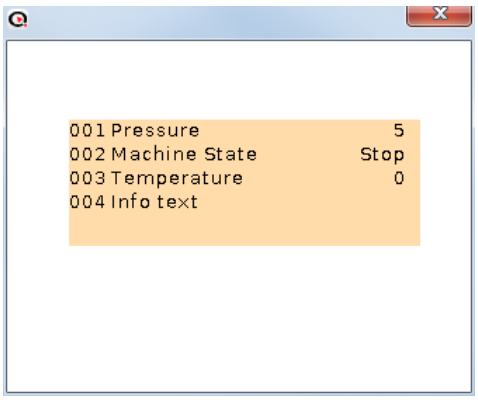


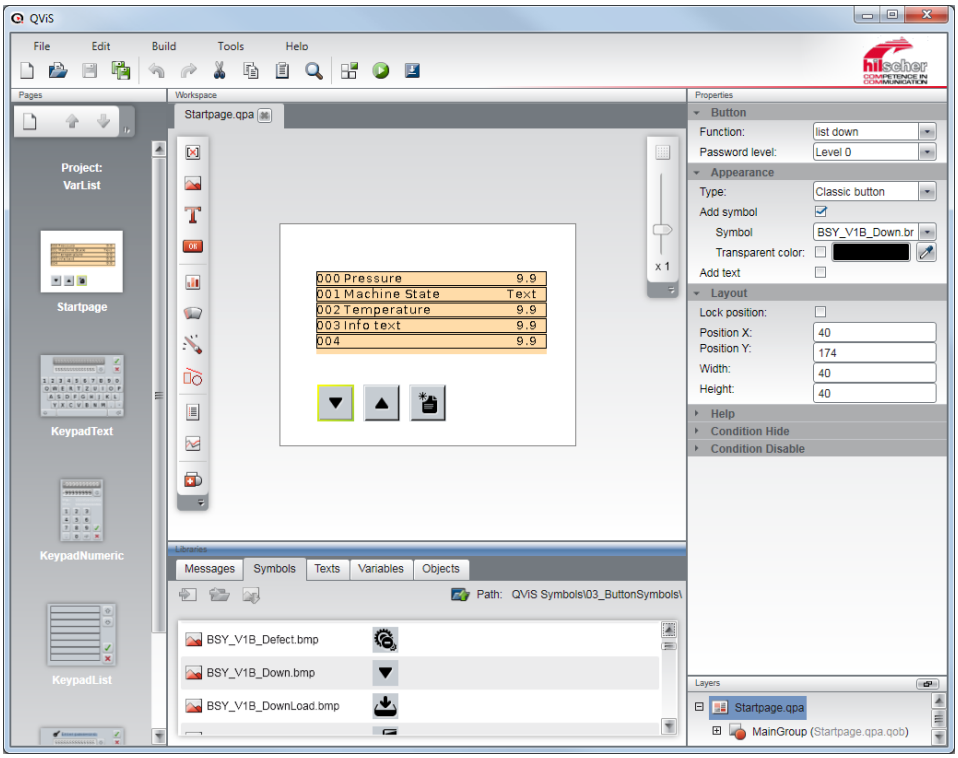

- When you click onto the variable list, the cursor appears and you can use the arrow key to scroll up and down
- The currently marked variable can be edited via the Enter key
- The Variable Pressure cannot be edited, because it has been declared as ReadOnly
- The Variable State can be edited via Text Selection, because it is displayed as a dynamic text
- In the case of Variable InfoText, the input keypad appears, because it is a STRING data type

### Step 7: Operating via Touch/Mouse

The project is expanded by a couple of buttons, enabling you to scroll through the list and edit it via Touch/Mouse.

For this purpose, insert three Element Buttons below the variable list and define the following three functions: list up, list down, list: edit variable

You can then freely position three symbols on the buttons. For example, you can use the symbols provided in the Symbol Library (QViS Symbols):





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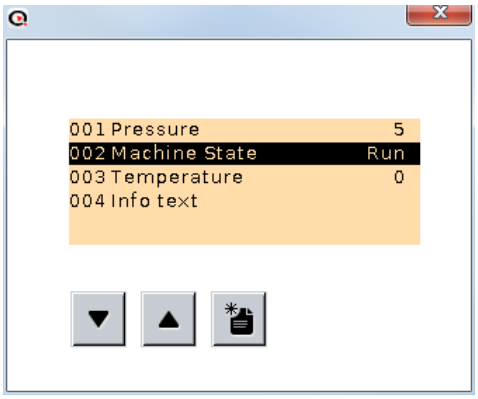
**Note:**

Texts or buttons can easily be stored on buttons via properties for "Appearance."

For this purpose, the texts or symbols must either be already available, or newly created.





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## 4.2 Trend

**Task:**

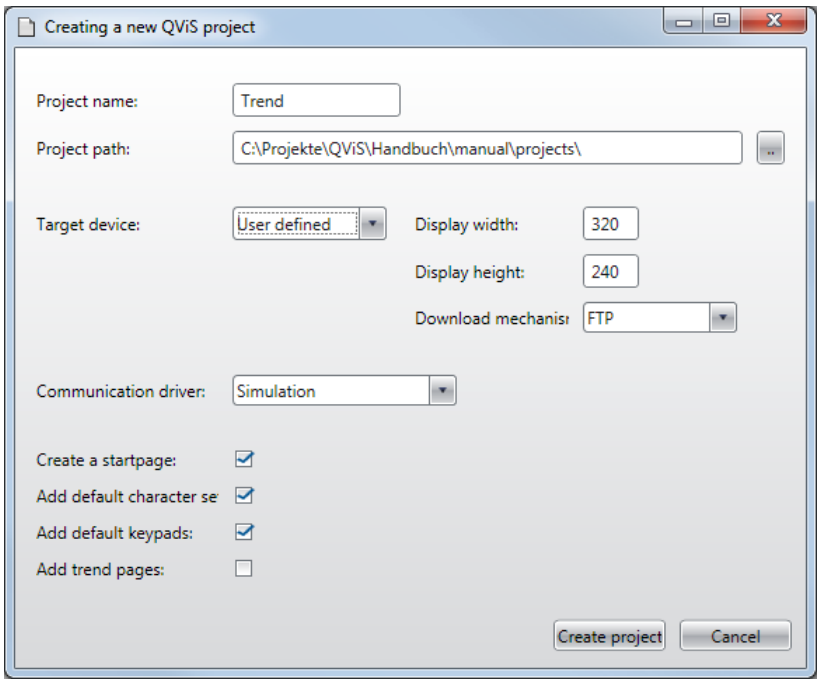
One of two variables are to be recorded in a Trend.

**Note:**

What is to be selectable in QViSRT during runtime in view of Trends must be parameterized and projected in QViS.

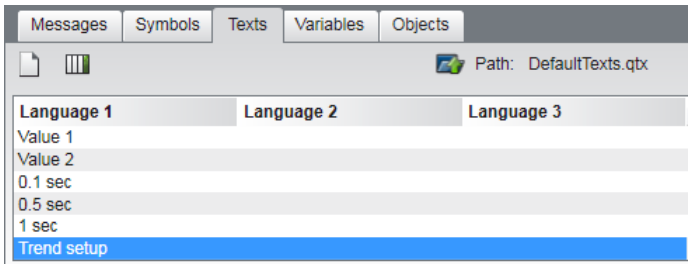
### Step 1: Create a new project

Create a new project (Menu File, New project…) and select the following settings:




### Step 2: Create texts

You now create the following texts:





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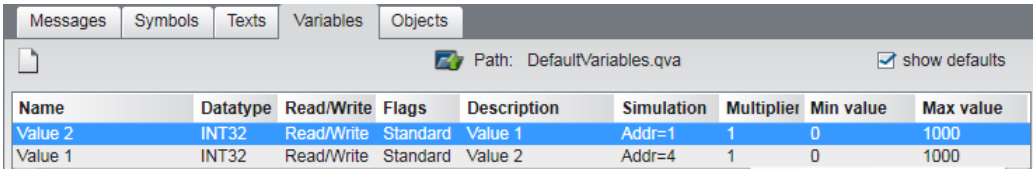
### Step 3: Create variables

Create the following variables:


Messages
Symbols
Texts
Variables
Objects
Path: DefaultVariables.qva
show defaults
Name Datatype Read/Write Flags Description Simulation Multiplier Min value Max value
Value 2 INT32 Read/Write Standard Value 1 Addr=1 1 0 1000
Value 1 INT32 Read/Write Standard Value 2 Addr=4 1 0 1000

| | | |
|---|---|---|
| Value1: | Data type: | INT32 |
| | Read/Write: | Read/Write |
| | Description: | "Value 1" |
| | Simulation Address: | 0 |
| | Min./Max.: | 0/1000 |
| Value2: | Data type: | INT32 |
| | Read/Write: | Read/Write |
| | Description: | "Value 2" |
| | Simulation Address: | 4 |
| | Min./Max.: | 0/1000 |

**Note:**

The extended settings for Min./Max. and further default values are displayed only after checking "show defaults."

The global default values can be overwritten when this is necessitated by the respective scenario. The preset default values correspond to the maximum possible values, e.g., 255 for UINT8.

### Step 4: Insert and position the element "Trend"

The page "Startpage" should already be open, if not, open it by clicking onto the element "Trend" in the Element List":

Position the element and define the following properties: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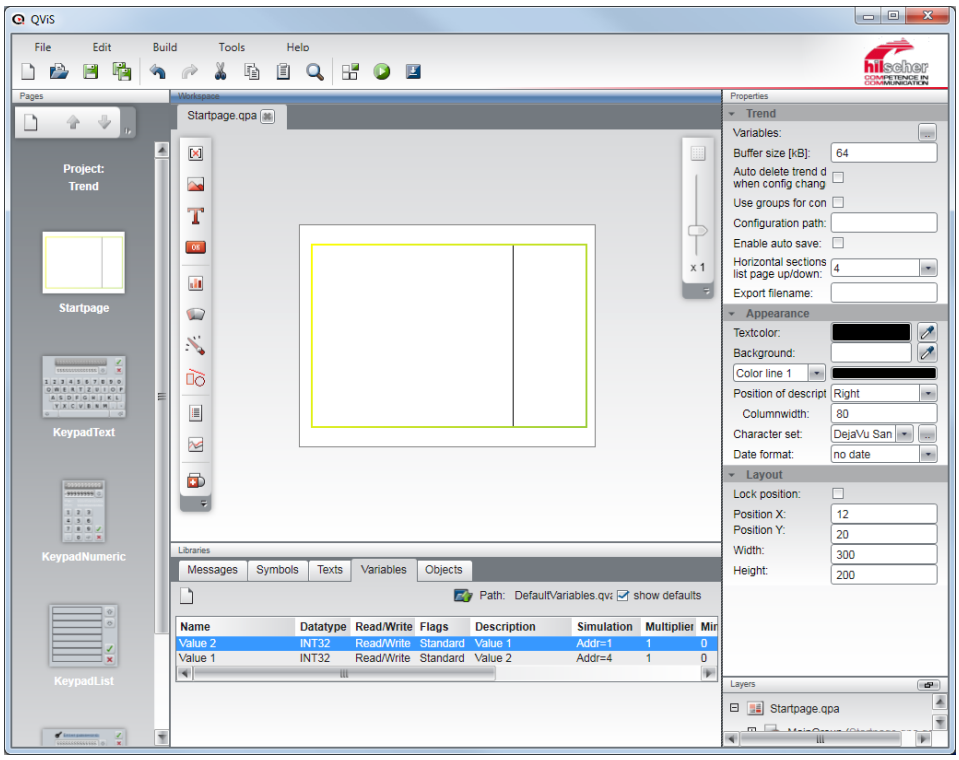
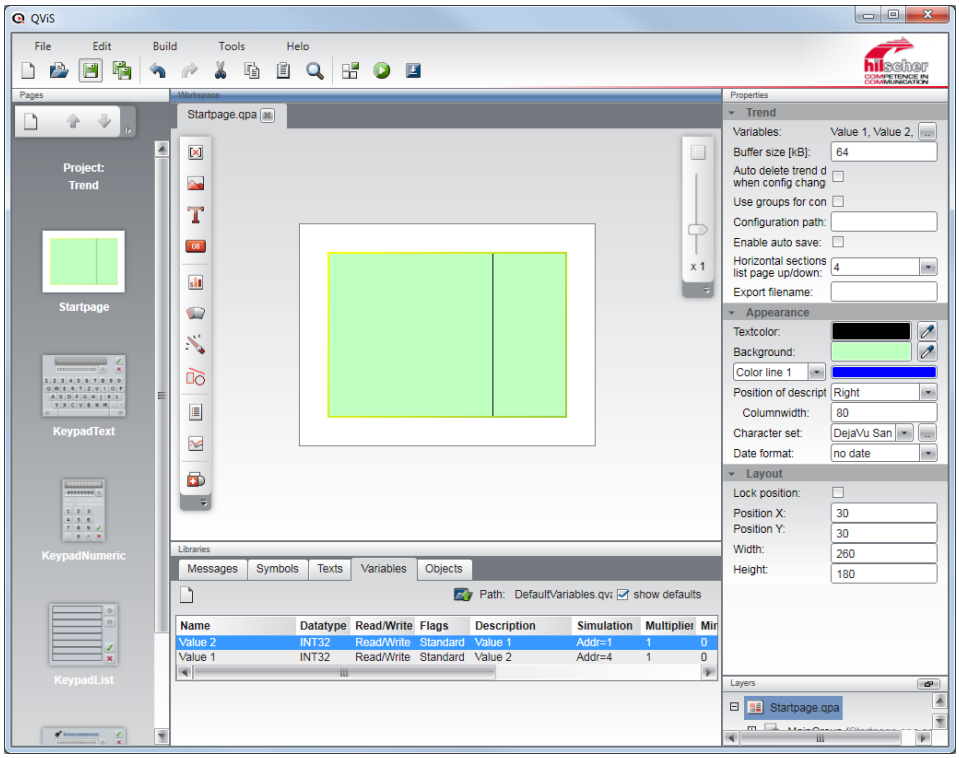


| | |
|---|---|
| Variables: | Value1, Value2 |
| Background: | Select the desired background color |
| Color line 1 + 2: | Select any colors you wish |
| Width: | 260 |
| Height: | 180 |



### Step 5: Position the variables and buttons

Position the two elements "Variable" to the right next to Trend and link them to the variables Value1 and Value2. Both variables take over the global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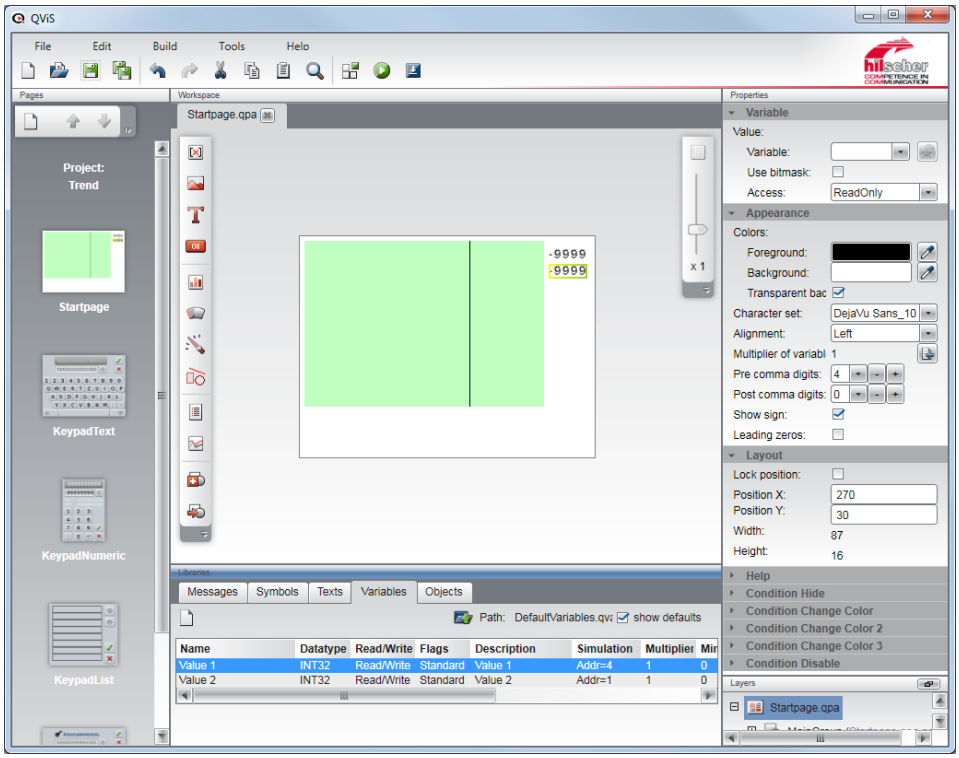
presettings and are thus set to Read/Write, as well as Maximum Limit of 1000 (can be modified locally):




Below Trend, position three Element Buttons with the functions:

- modify variable directly,
  Variable= SYS_TrendState,
  Style= set – hold – reset,
  Set value= 1,
  Reset value= 0
- trend clear
- trend setup…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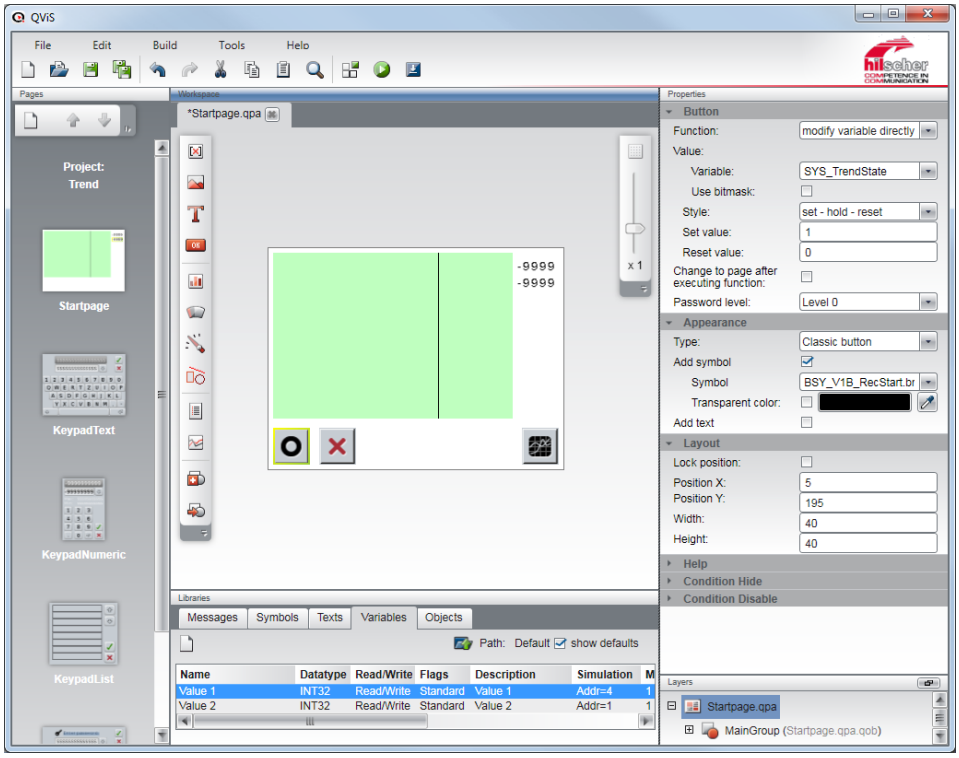
You can optionally position symbols on the buttons to clearly indicate the functionality behind it.




**Note:**

Texts or buttons can easily be stored on buttons via properties for "Appearance."

For this purpose, the texts or symbols must either be already available, or newly created.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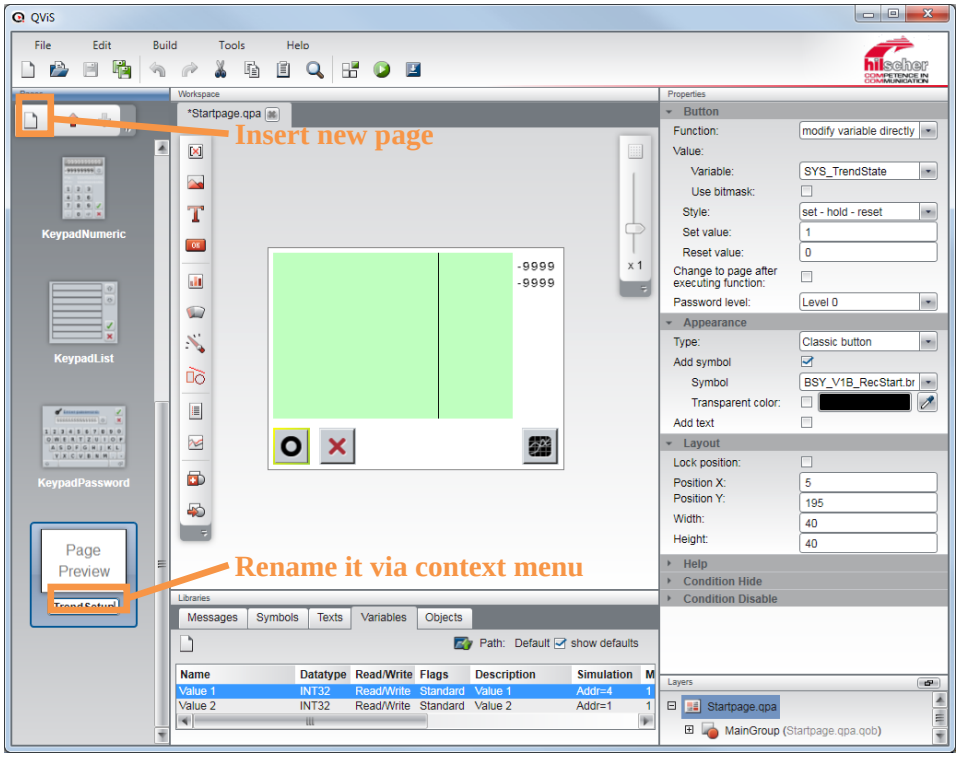
### Step 6: Create the Trend setup page

Insert a new page, rename it TrendSetup, and then open the page:




Add the following elements:

| | | |
|---|---|---|
| Text | Text: | Trend setup |
| Button | Function:<br>Variable:<br>Style:<br>Set value:<br>reset value: | modify variable directly<br>SYS_TrendShow_1<br>set – hold – reset<br>1<br>0 |
| Variable | Variable:<br>Background:<br>Format:<br>String length:<br>Access: | SYS_TrendVar_1<br>e.g. yellow<br>String<br>12<br>Read/Write |
| Text | Dynamic text<br>Variable:<br>Texts:<br><br><br>Background:<br>Access: | TRUE<br>SYS_TrendInterval_1<br>0 – 0: 0.1 sec<br>1 – 1: 0.5 sec<br>2 – 2: 1 sec<br>e.g. yellow<br>Read/Write |
| Button | Function: | Key "ENTER" |
| Symbol | Symbol: | BSY_V1C_OK_small.bmp |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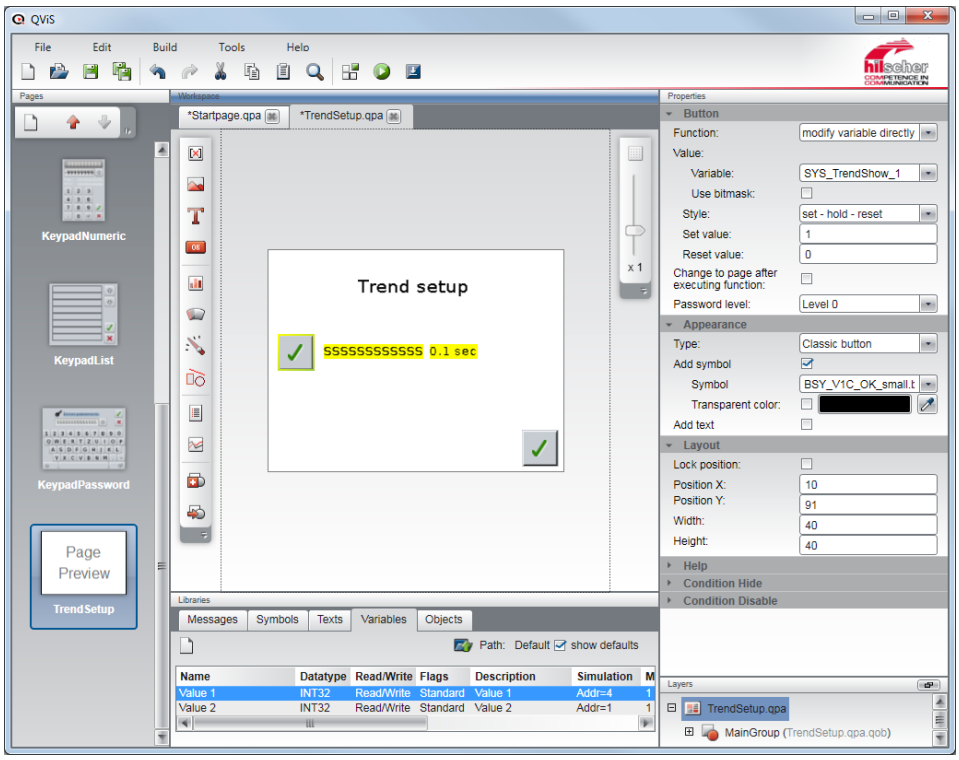
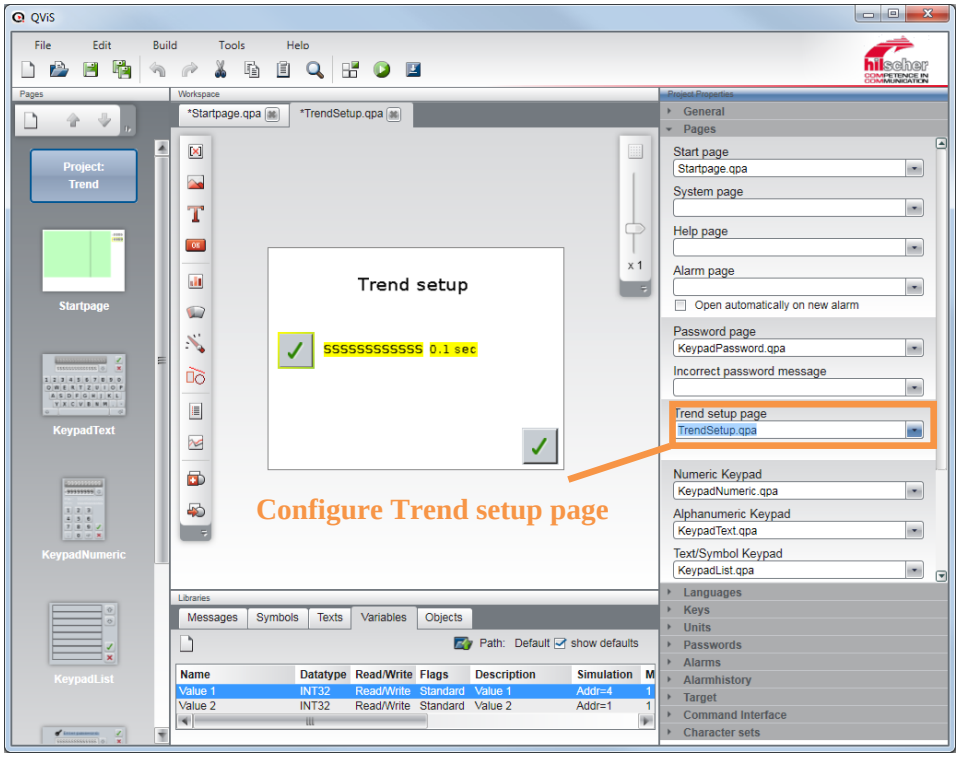



Store this page and define this page as the Trend setup page in the project properties:




**Step 7: Build and simulate the project**

Build the project and launch the simulation:

Change to the TrendSetup page and configure the Trend as follows: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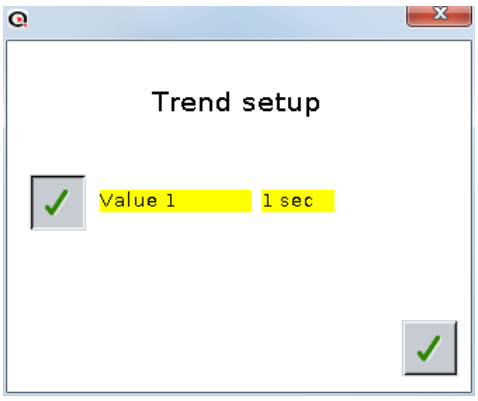
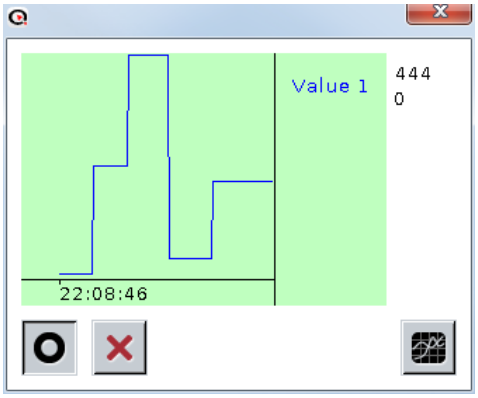



Change back to the start page and launch the recording via the button to the far left. Change the value of Variable Value1 by clicking onto the variable and checking whether the Trend functions:





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# 4.3 Handling Alarms

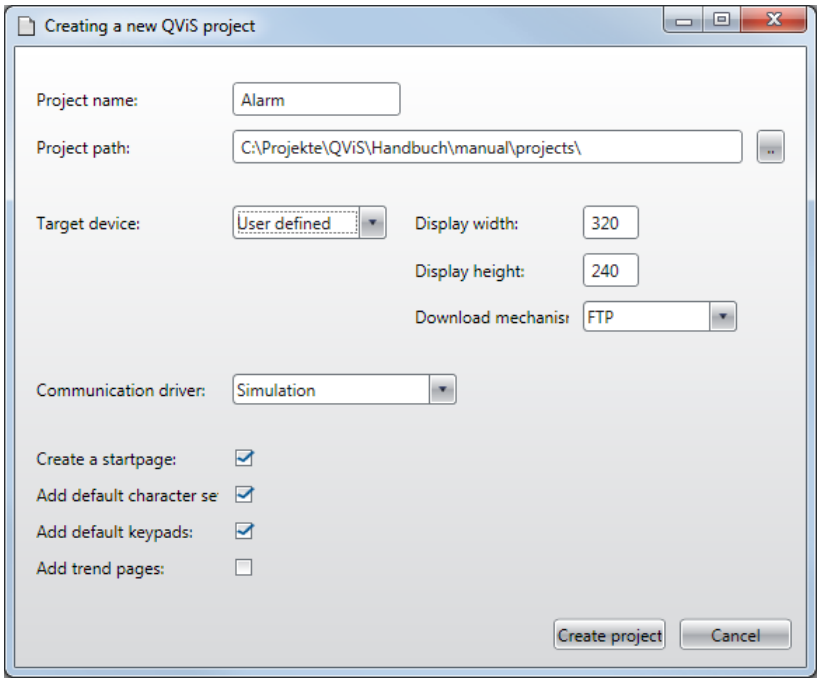
## 4.3.1 Creating an Alarm List

**Task:**

- An alarm list is to be created.
- Users should be able to set and delete alarms.

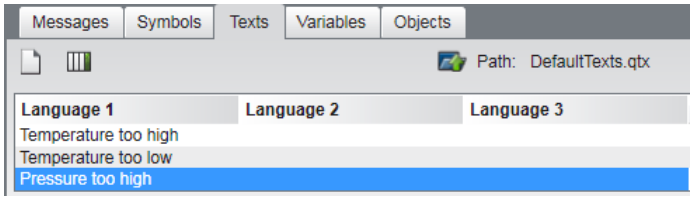
### Step 1: Create a new project

Create a new project (Menu File, New project…) and select the following settings:



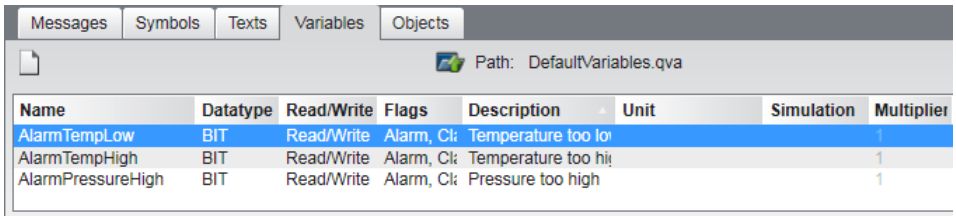

### Step 2: Create texts

You now create the following texts:




### Step 3: Create variables

Create the following variables:




AlarmTempHigh: Data type: BIT
Read/Write: Read/Write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| | | |
|---|---|---|
| | Flags: | Alarm, Class 1 |
| | Description: | "Temperature  too high" |
| | Simulation Address: | 0, Bit 0 |
| AlarmTempLow: | Data type: | BIT |
| | Read/Write: | Read/Write |
| | Flags: | Alarm, Class 1 |
| | Description: | "Temperature too low" |
| | Simulation Address: | 0, Bit 1 |
| AlarmPressureHigh: | Data type: | BIT |
| | Read/Write: | Read/Write |
| | Flags: | Alarm, Class 1 |
| | Description: | "Pressure too high" |
| | Simulation Address: | 0, Bit 2 |

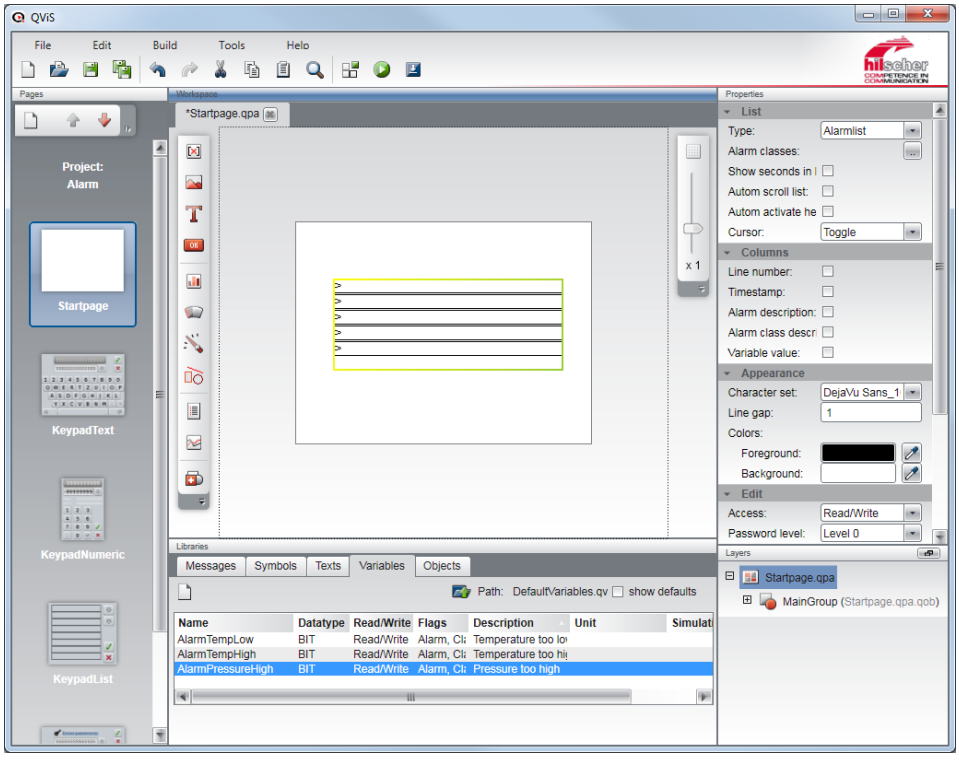
**Note:**

The setting possibilities for the simulation are restricted, so simulating real is limited. The simulation settings have no influence on other driver settings.

### Step 4: Insert and position the element "List"

The page "Startpage" should already be open, if not, open it by clicking onto the element "List" in the Element List":

Position the element on the start page:





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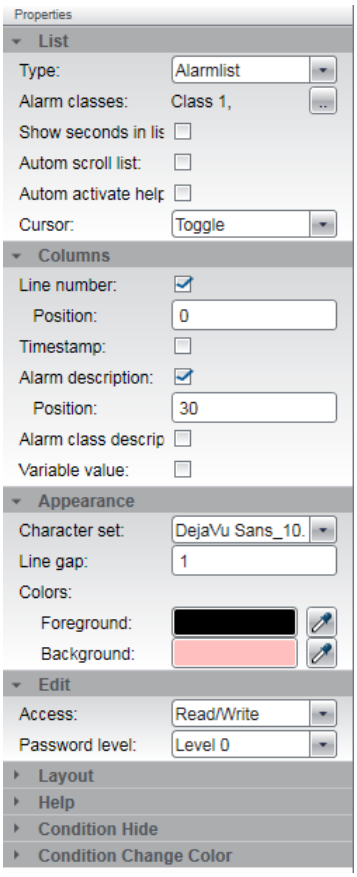
**Step 5: Defining the list's properties:**




| | |
|---|---|
| Type: | Alarm list |
| Alarm classes: | Class 1 |
| Columns: | Line number on Position 0<br>Alarm description on Position 30 |
| Background: | Freely select the background color |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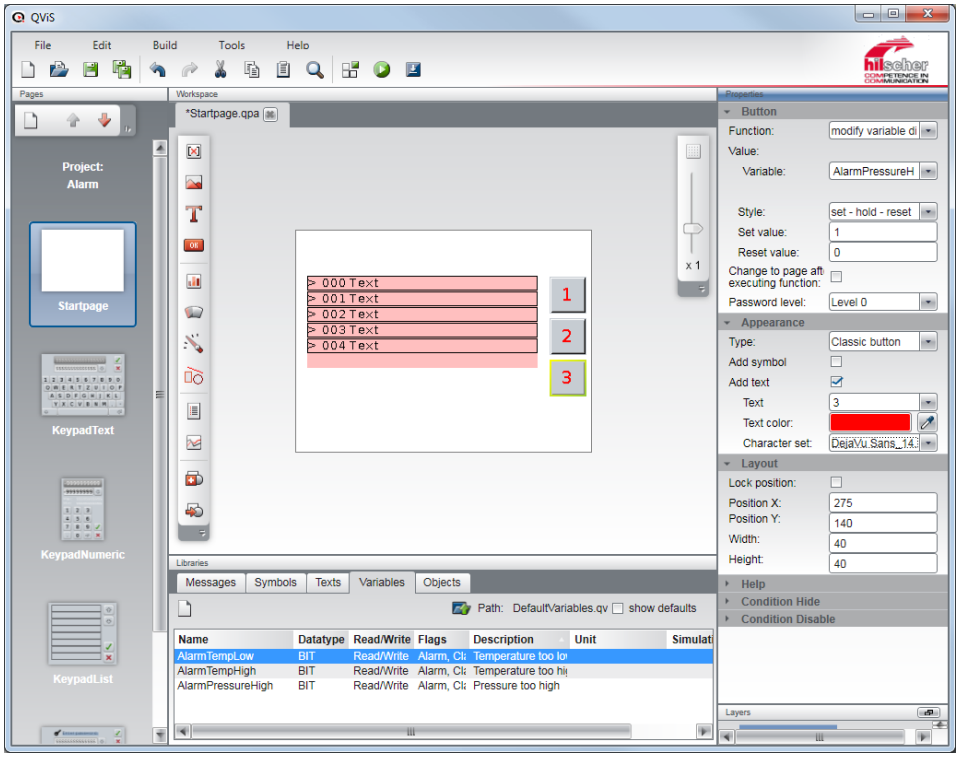
### Step 6: Inserting buttons

Position three buttons next to the list so that you can set alarms. To better distinguish between the buttons, you can also overlay it with a text or symbol:




| | | |
|---|---|---|
| Button 1 | Function: | modify variable directly |
| | Variable: | AlarmTempHigh |
| | Style: | set – hold – reset |
| | Set value: | 1 |
| | reset value: | 0 |
| Button 2 | Function: | modify variable directly |
| | Variable: | AlarmTempLow |
| | Style: | set – hold – reset |
| | Set value: | 1 |
| | reset value: | 0 |
| Button 3 | Function: | modify variable directly |
| | Variable: | AlarmPressureHigh |
| | Style: | set – hold – reset |
| | Set value: | 1 |
| | reset value: | 0 |

**Note:**

Texts or buttons can easily be stored on buttons via properties for "Appearance."

For this purpose, the texts or symbols must either be already available, or newly created.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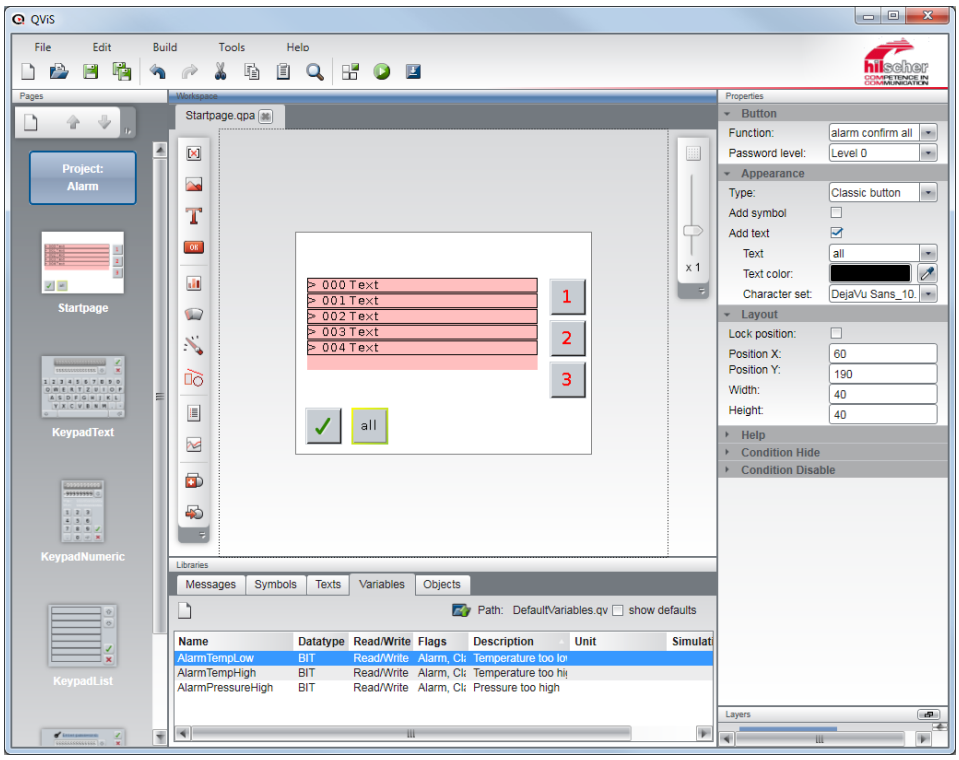
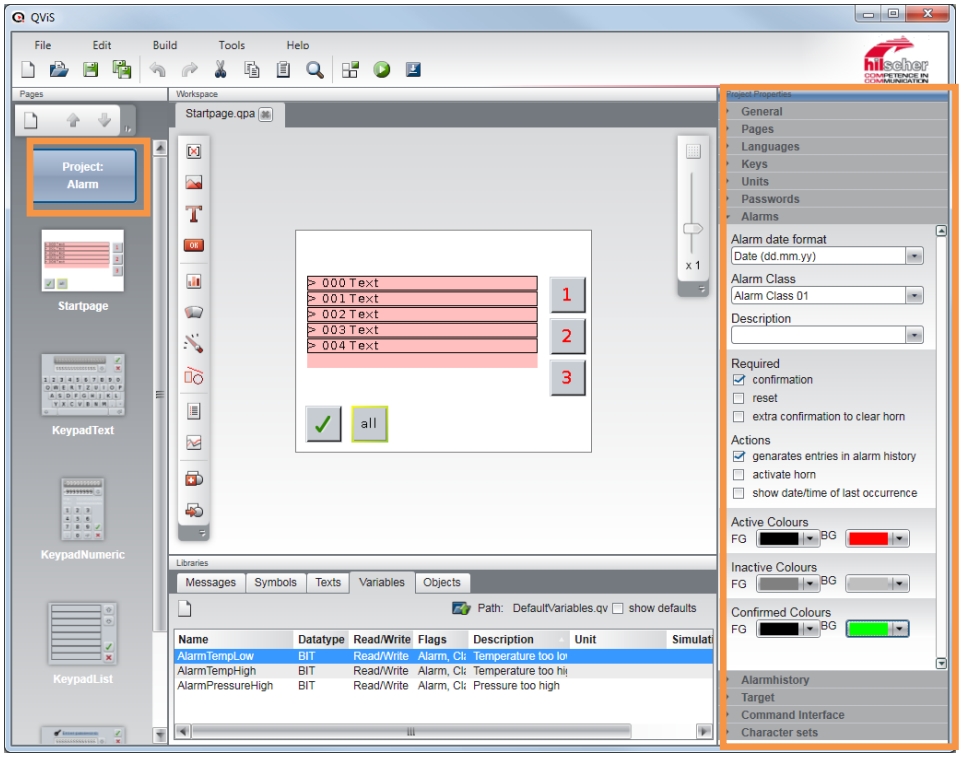
To enable the alarms being confirmed, position two further buttons below the list with the functions "Alarm confirm" and "Alarm confirm all." You may also freely overlay these buttons with a text or symbol:




### Step 7: Defining alarm classes

Open the Project Properties and define the following settings:





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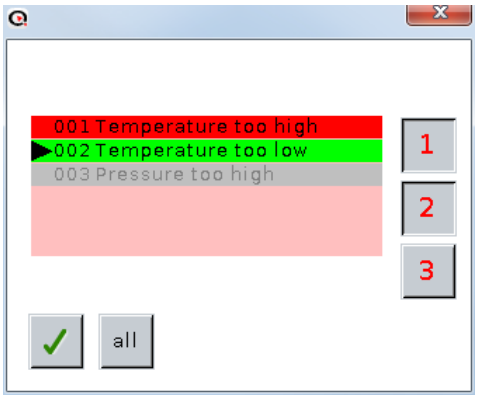
**Step 6: Build and simulate the project**

Build the project and launch the simulation:




- You can activate and deactivate the alarms with the three buttons on the right-hand side
- Confirm the alarms via the key below the list

## 4.3.2 Creating an Alarm History List

**Task:**

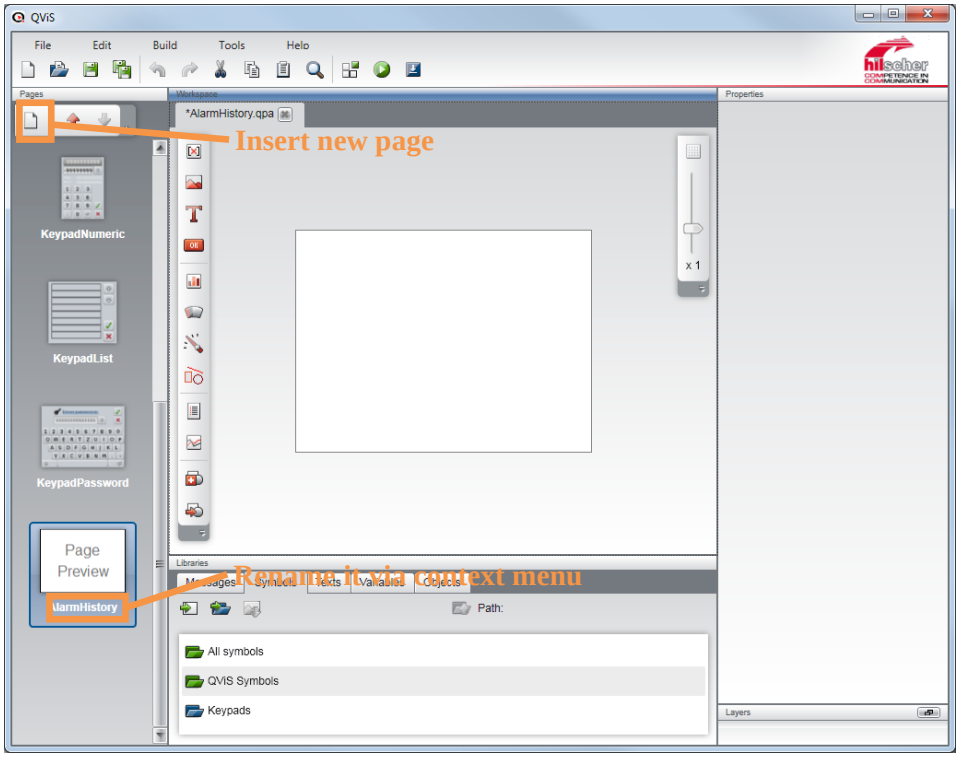
- An Alarm History list is to be created.
- Users should be able to set and delete alarms.

**Step 1: Create a new project**

Please first create the project as described in the previous application example "Creating an Alarm List" and continue as follows.

**Step 2: Creating an alarm history list**

Create a new page, name it AlarmHistory and open the page:





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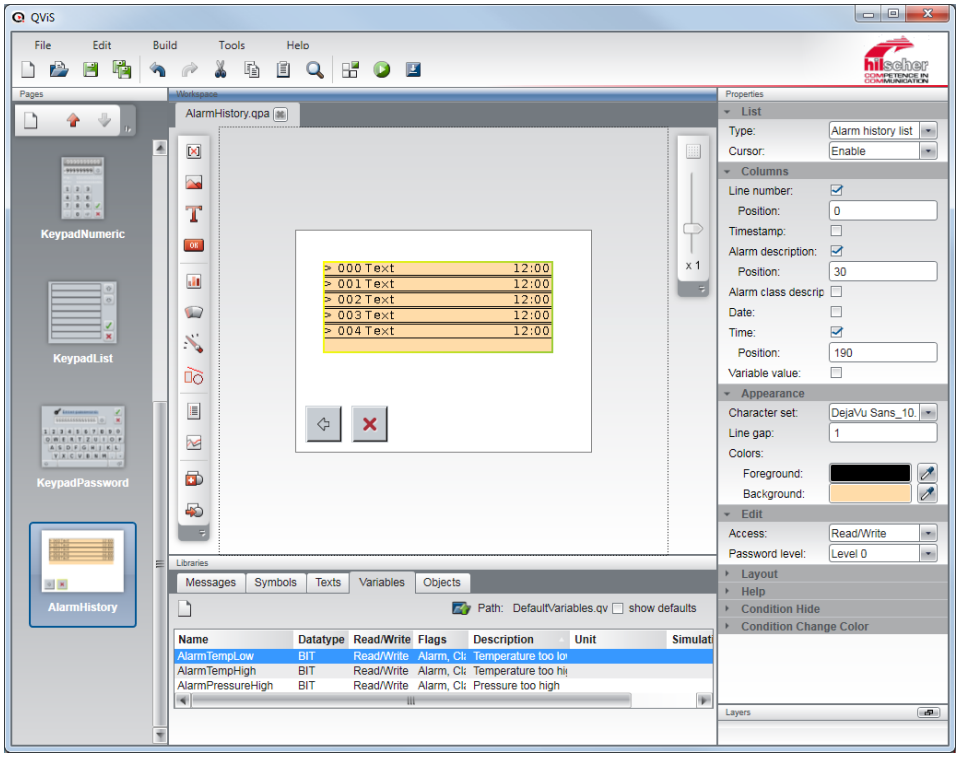
Insert the following elements:




| | | |
|---|---|---|
| List | Type: | Alarm history list |
| | Cursor: | Enable |
| | Columns: | Line number, Position= 0<br>Alarm description, Pos.= 30<br>Time, Position= 190 |
| | Colors: desired | Freely select the colors |
| Button | Function: | Change to previous page |
| Button | Function: | Alarm history delete entries |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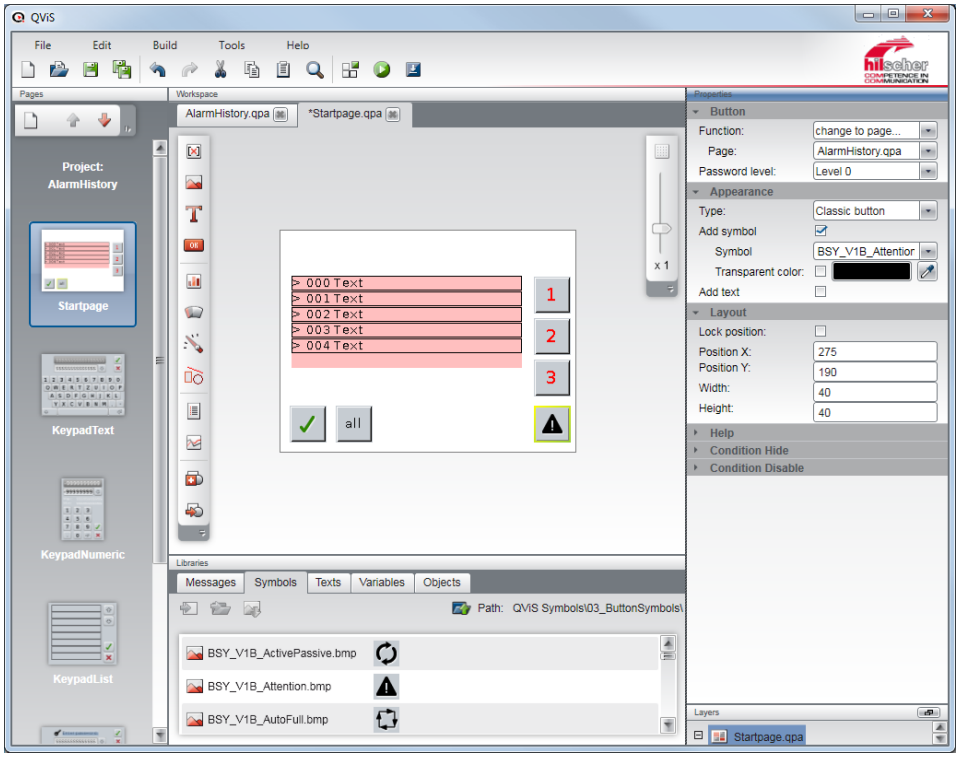
Insert a further button on the start page so that you can change to the newly created page:





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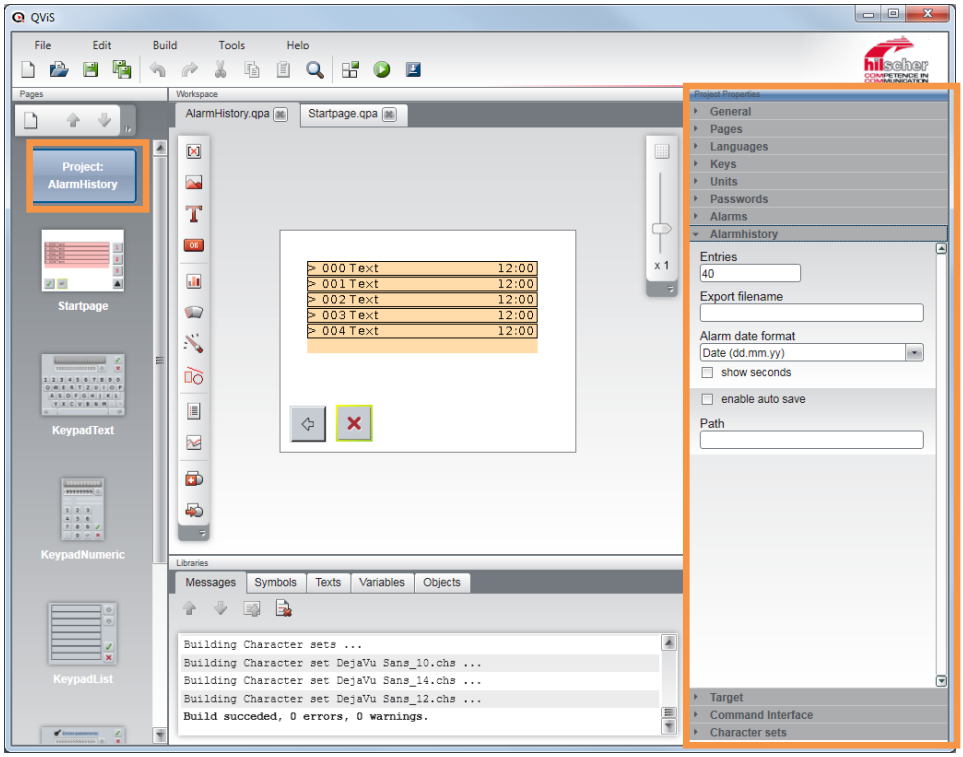
### Step 3: Configuring the alarm history

Open Project Properties and set the number of alarm history entries to 40:




**Note:**

All alarms that occurred can be exported to an ASCII file via the function "alarm history export," which can likewise be executed via a button. For this purpose, a file name, and if necessary a path, must be defined under "Export filename."

Files and directories are stored relative to the path in the QViSRT.cfg indicated in your QViS runtime system.

**Note:**

If "enable auto save" is activated, an alarm history is automatically and consecutively stored in binary form in the default path defined in the QViSRT.cfg of your QViS runtime system.

If a path is specified, relative to the path defined in the QViSRT.cfg, it is created and used to store the alarm history.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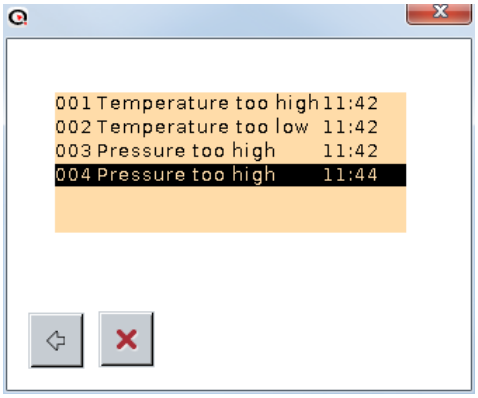
**Step 4: Build and simulate the**

Build the project and launch the simulation:





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# 4.4 Switching Languages

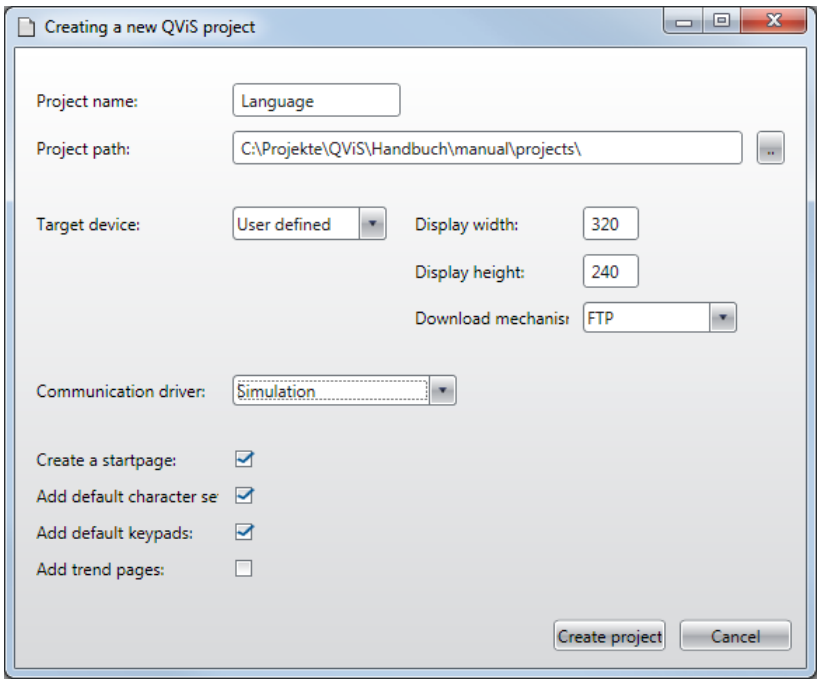
## 4.4.1 Creating a Multi-language Project

**Task:**

The language of the displayed texts should be switchable during runtime.

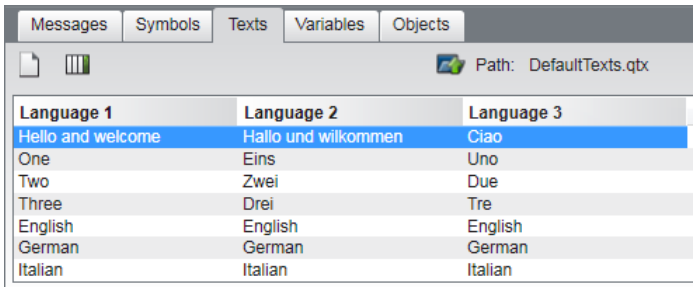
**Step 1: Create a new project**

Create a new project (Menu File, New project…) and select the following settings:




**Step 2: Create texts**

You now create the following texts:




| Language 1 | Language 2 | Language 3 |
|---|---|---|
| Hello and welcome | Hallo und wilkommen | Ciao |
| One | Eins | Uno |
| Two | Zwei | Due |
| Three | Drei | Tre |
| English | English | English |
| German | German | German |
| Italian | Italian | Italian |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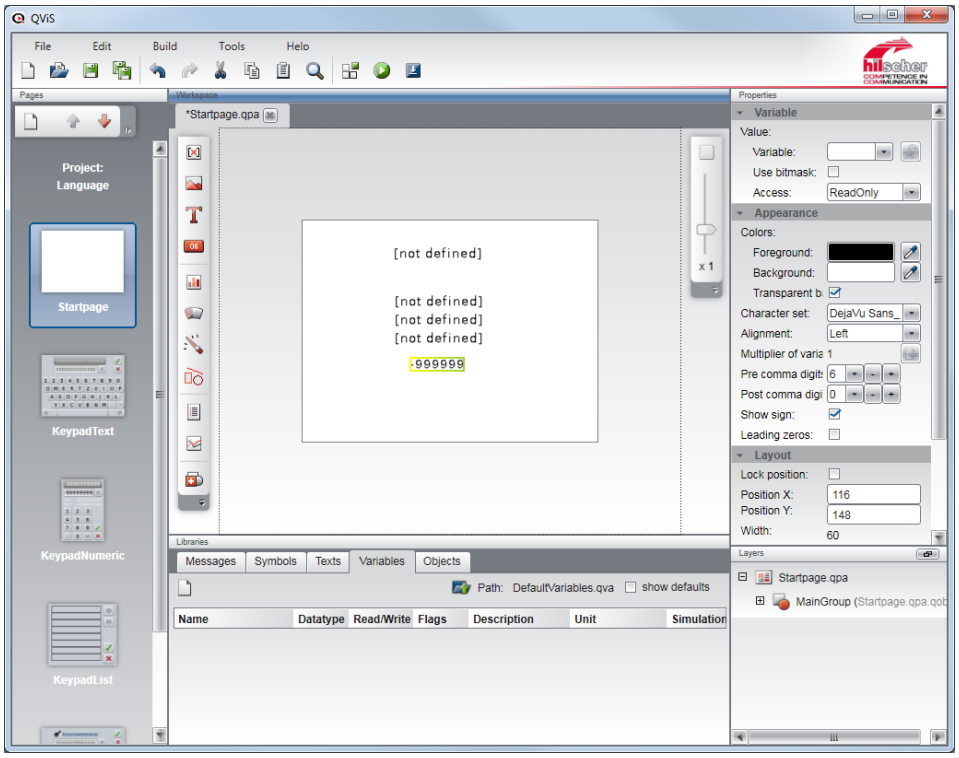
### Step 3: Creating a page

Open the page "Startpage," and insert four text elements and one variable element:




| | | |
|---|---|---|
| Text | Text: | "Hello and welcome” |
| Text | Text: | "One” |
| Text | Text: | "Two” |
| Text | Text: | "Three” |
| Variable | Variable:<br>Access: | SYS_LanguageNr<br>Read/Write |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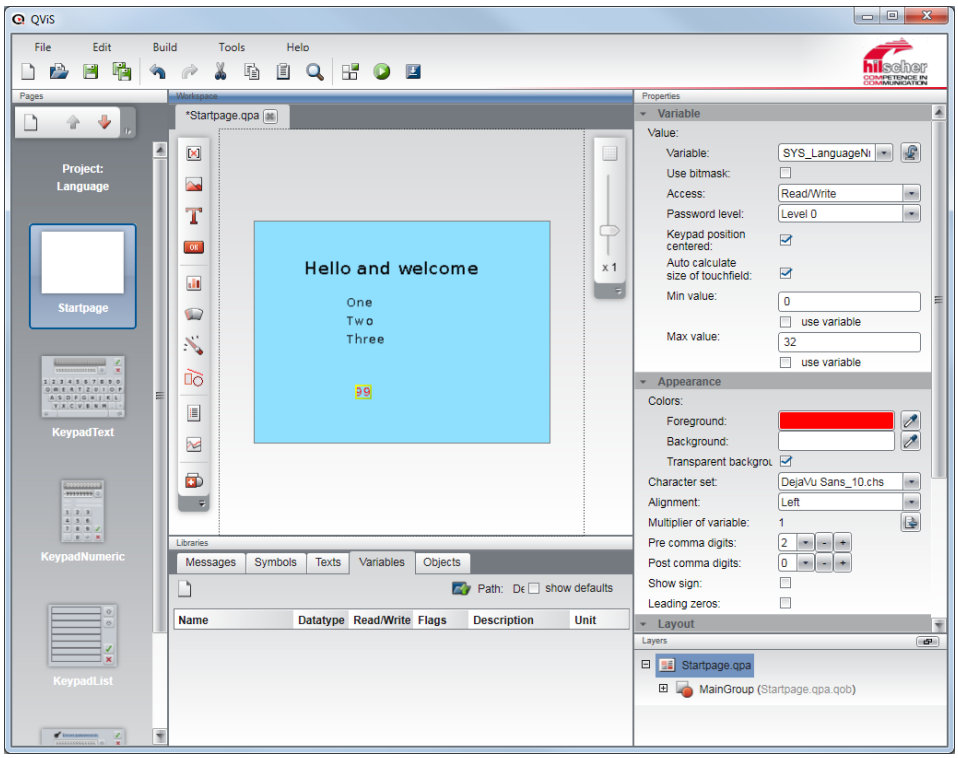
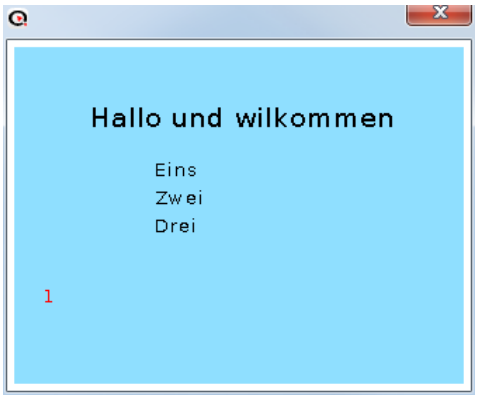



### Step 4: Build and simulate the project

Build the project and launch the simulation:




When you click onto the red number, you can directly enter the language index. All texts will be displayed in the languages selected.

### Step 5: Expanding the project

We now know that languages can be switched by simply writing the systems SYS_LanguageNr. The following element can likewise be used to switch languages:

| | | |
|---|---|---|
| Text | Dynamic text: | TRUE |
| | Variable: | SYS_LanguageNr |
| | Texts: | 0 – 0: English |
| | | 1 –1: German |
| | | 2 – 2: Italian |
| | Access: | Read/Write |
| Symbol | Dynamic symbol: | TRUE |
| | Variable: | SYS_LanguageNr |
| | Symbols: | 0 – 0: Bitmap for English |
| | | 1 –1: Bitmap for German |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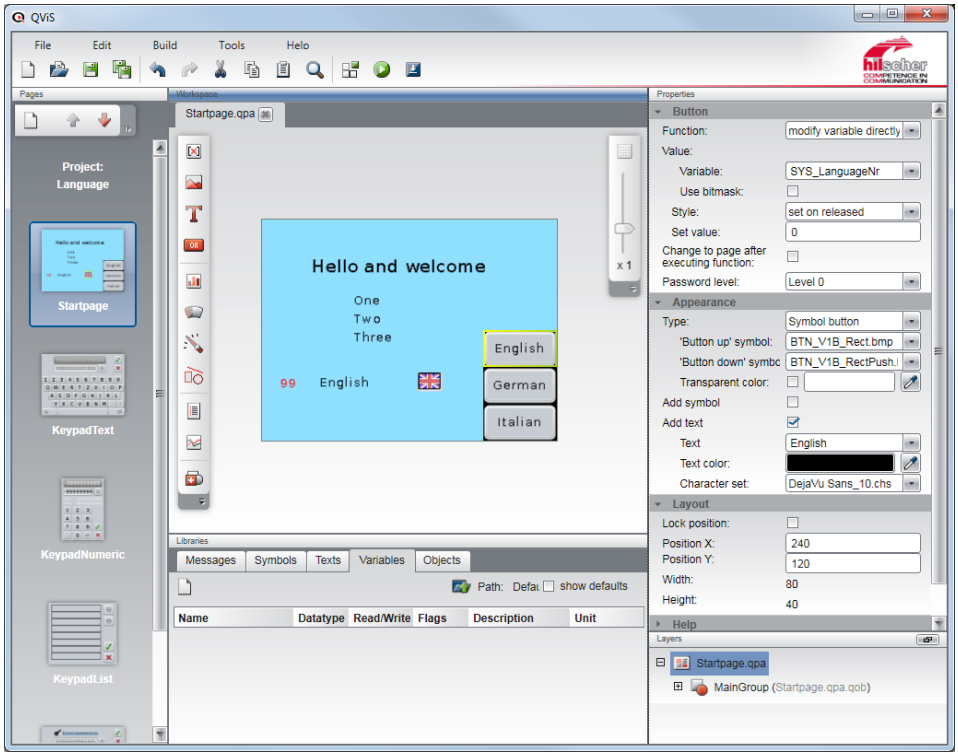
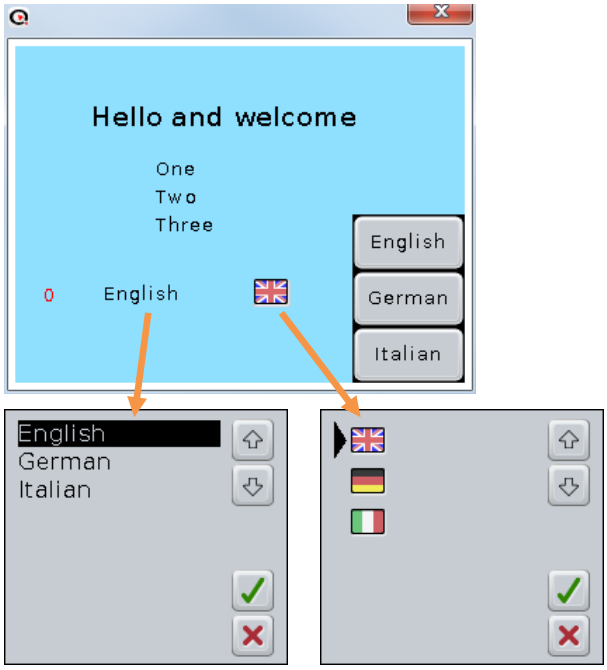
| | | |
|---|---|---|
| | | 2 – 2: Bitmap for Italian |
| | Access: | Read/Write |
| Button | Function: | modify variable directly |
| | Variable: | SYS_LanguageNr |
| | Style: | set on released |
| | Set value: | 0, 1 or 2<br>e.g. 2 for Italian |




In the simulation, it looks like this:





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## 4.4.2 Creating Text Lists Using MS Excel

**Task:**

A text list is to be created and used in QViS.

**Note:**

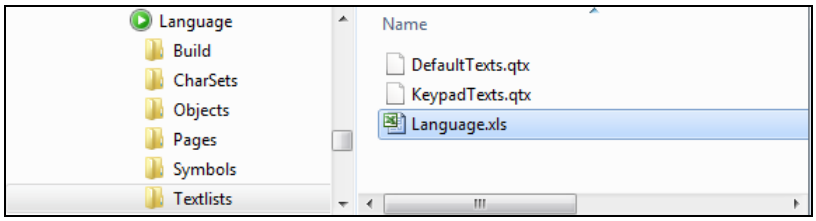
The whole purpose of this mechanism is that external translation agencies, freelancers or other staff involved with the translation do not need to learn how to use QViS.

The projector need only to create an Excel table that fully maps the language. This is then made available to the translator.

### Step 1: Copying the Excel table to the desired project

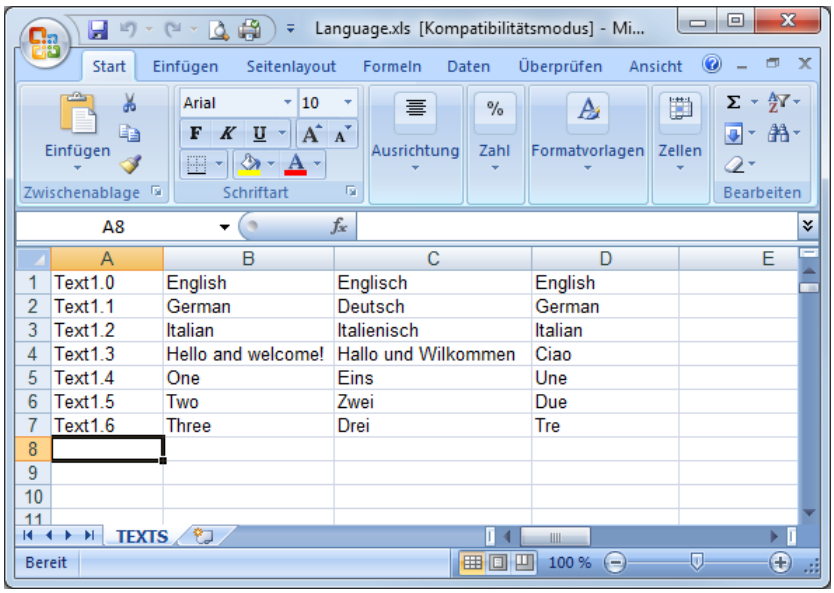
Create a copy of the Excel table provided (QViS-Texts.xls from the Directory ".\My Documents\QViS Projects\TextsWithExcel") in the sub-folder ".\Textlists" of your QViS project.

You can freely name the file (e.g., <projectname>.xls).




### Step 2: Opening and editing the Excel table

Open the table using MS Excel and enter the desired texts as follows:





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Column A:

Enter an identifier here, making sure that this identifier is not used twice. Each text (each line) requires its own identifier. An identifier may not contain any blank spaces!

Column B:

Text in Language 1 (Language 1)

Column C:

Text in Language 2 (Language 2)

Column D:

Text in Language 3 (Language 3)

…

**Step 3: Saving the Excel table and automatically generating the *.xls.qtx file**

By saving the Excel file, a file ending in xls.qtx is automatically generated.

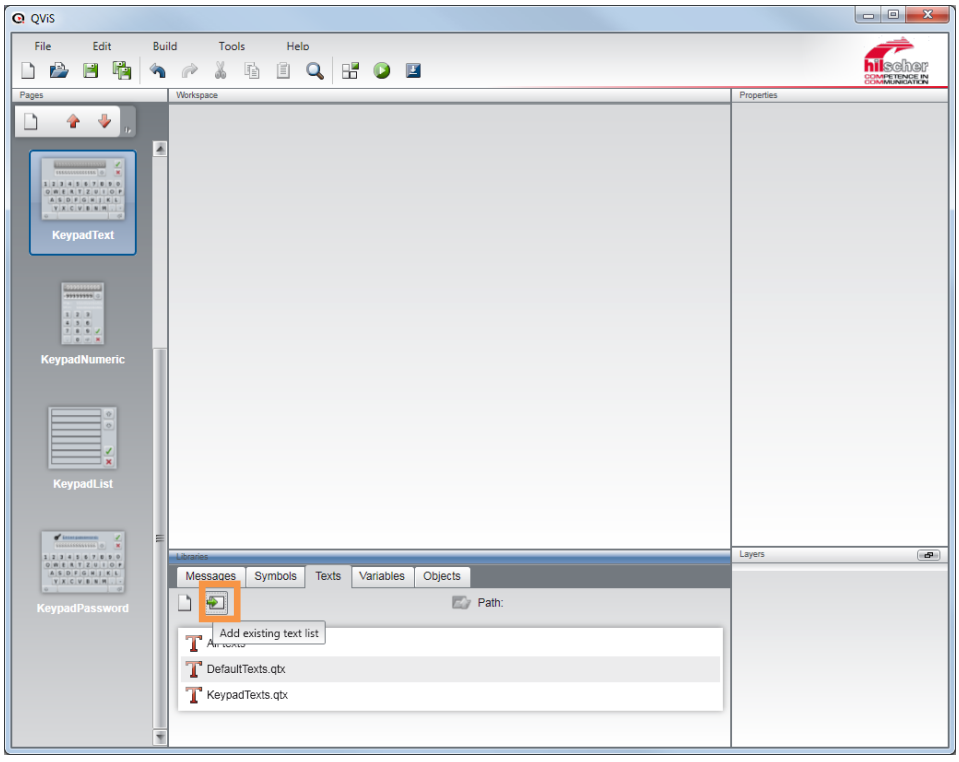
**Note:**

The Excel table contains a macro, which enables the automatic generation of the qtx file.

Macros must be activated for this Excel table.

**Step 4: Adding a text list to QViS**

You add a text list to QViS by activating "Add existing text list" in the text window:





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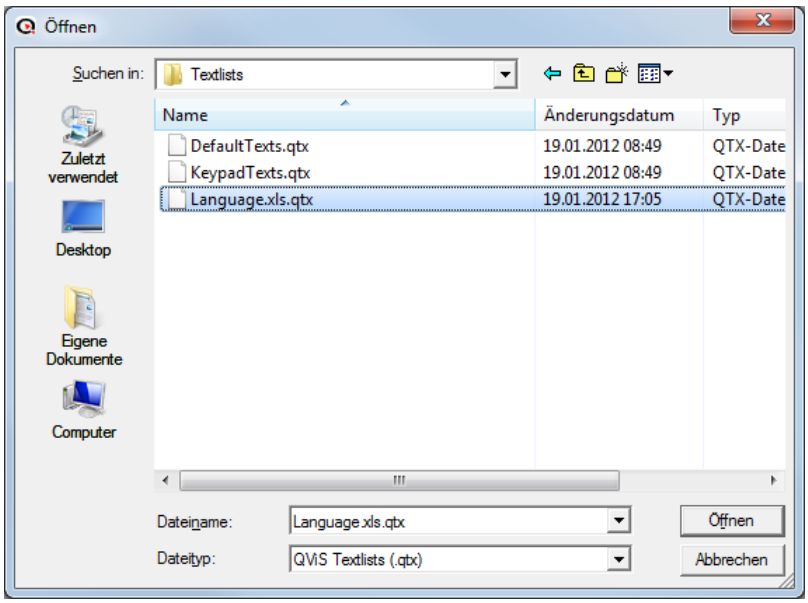


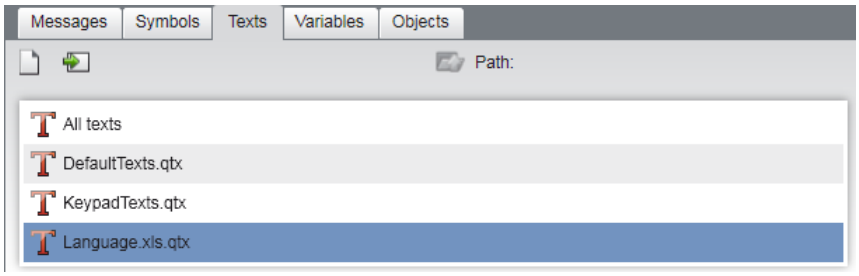


The texts can now be used in QViS. The texts cannot be edited in QViS. Edit the text list in the Excel table.

**Note:**

A text list created in Excel cannot be edited in QViS, because when saving the Excel table, it is overwritten.

Indirectly edit the text list via the Excel table.


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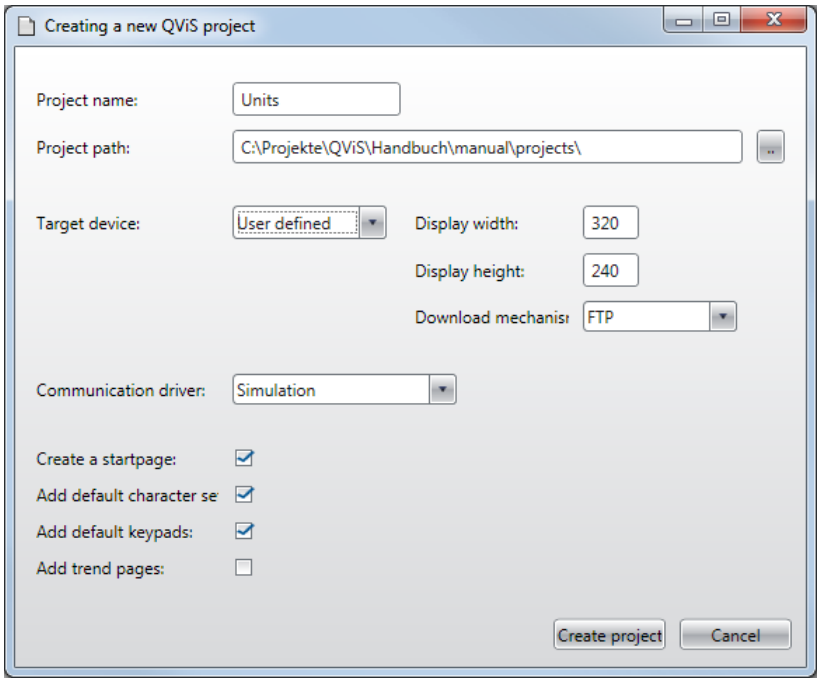
# 4.5 Switching Units

**Task:**

- A temperature variable and a length variable are to be displayed.
- A unit should be selectable (e.g., °Celsius or Kelvin)

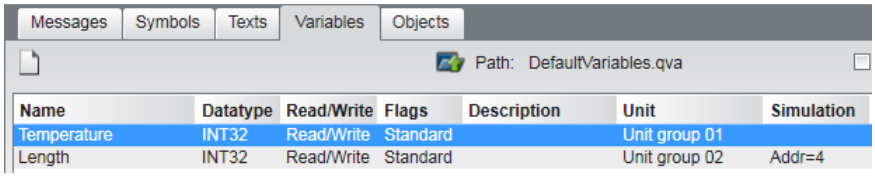
### Step 1: Create a new project

Create a new project (Menu File, New project…) and select the following settings:




### Step 2: Create variables

You now create the following variables:




| Name | Datatype | Read/Write | Flags | Description | Unit | Simulation |
|---|---|---|---|---|---|---|
| Temperature | INT32 | Read/Write | Standard | | Unit group 01 | |
| Length | INT32 | Read/Write | Standard | | Unit group 02 | Addr=4 |

| | | |
|---|---|---|
| Temperature: | Data type: | INT32 |
| | Read/Write: | Read/Write |
| | Unit: | Unit group 01 |
| | Simulation, Address: | 0 |
| Length: | Data type: | INT32 |
| | Read/Write: | Read/Write |
| | Unit: | Unit group 02 |
| | Simulation, Address: | 4 |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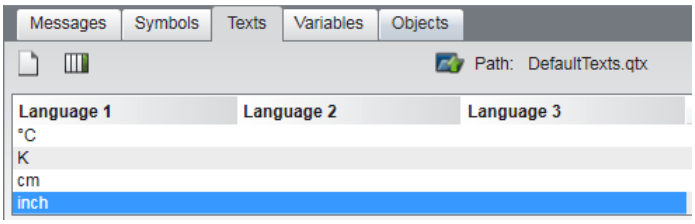
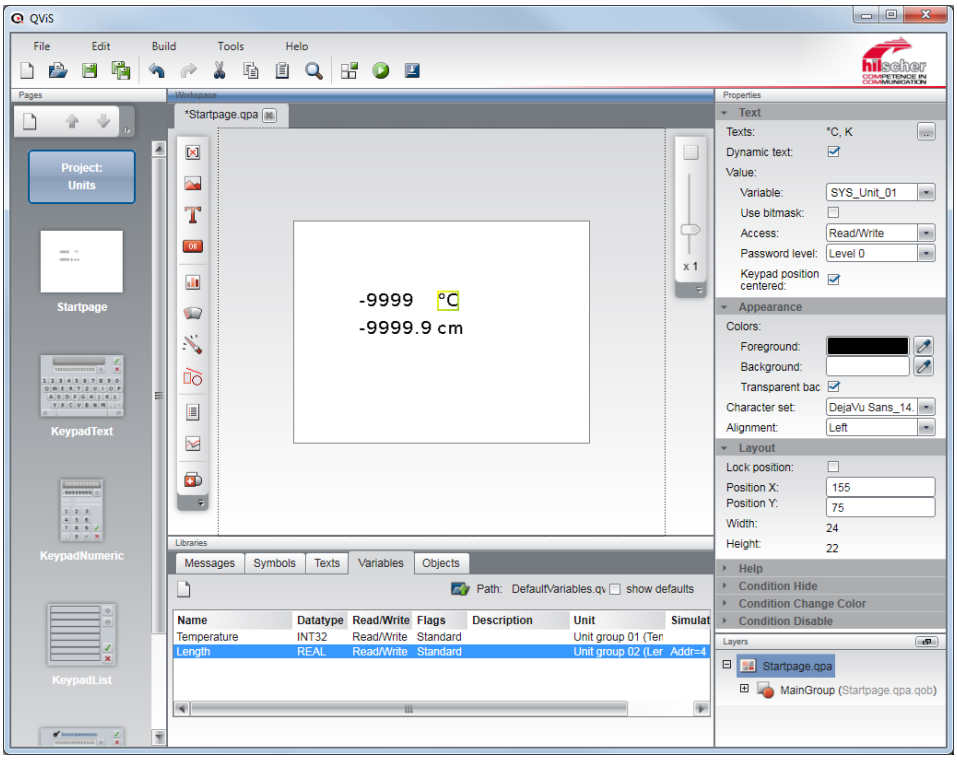
### Step 3: Create texts

Now create the following texts:




### Step 4: Position the Elements

Open the page "Startpage" and position two variables and two texts:




| | | |
|---|---|---|
| Variable 1 | Variable: | Temperature |
| | Pre decimal digits: | 4 |
| | Post decimal digits: | 0 |
| | Access: | Read/Write |
| Variable 2 | Variable: | Length |
| | Pre decimal digits: | 4 |
| | Post decimal digits: | 1 |
| | Access: | Read/Write |
| Text 1 | Dynamic text: | TRUE |
| | Variable: | SYS_Unit_01 |
| | Texts: | 0 - 0, °C |
| | | 1 - 1, K |
| | Access: | Read/Write |
| Text 2 | Dynamic text: | TRUE |
| | Variable: | SYS_Unit_02 |
| | Texts: | 0 – 0, cm |
| | | 1 – 1, inch |
| | Access: | Read/Write |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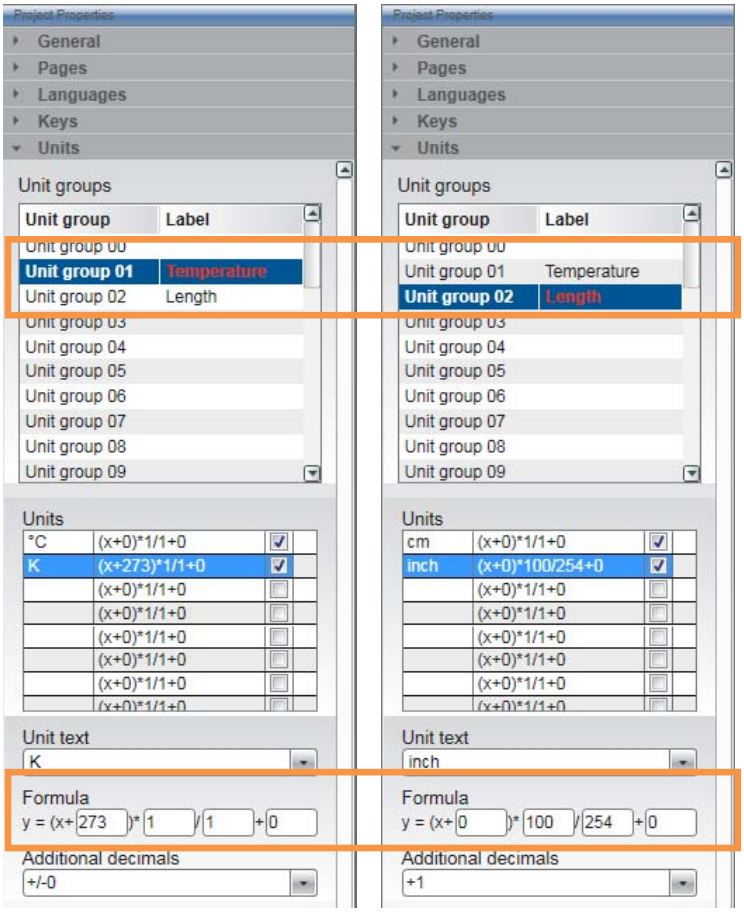
**Step 5: Define the conversion formula:**

Open the Project Properties and define the conversion formulas for Unit groups 01 and 02:




**Note:**

The column entitled "Label" in the table "Unit Groups" has no technical relevance. It serves the purpose of improving readability, as otherwise it would not be immediately apparent, which Unit Group displays what.

**Note:**

In the table "Units," up to eight corresponding units and their conversion formulas can be specified (e.g., °C, K, °F, …).

Apart from the conversion formula, it is helpful to select a "Unit text" so that the respective lines can be easily allocated.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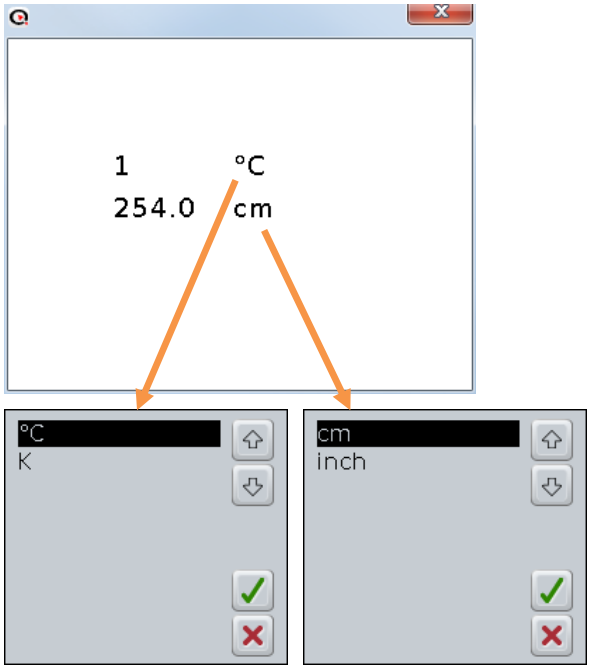
**Step 5: Build and simulate the project**

Build the project and launch the simulation:




Click onto a unit to set a new unit.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# 4.6 Using and Creating Keypads

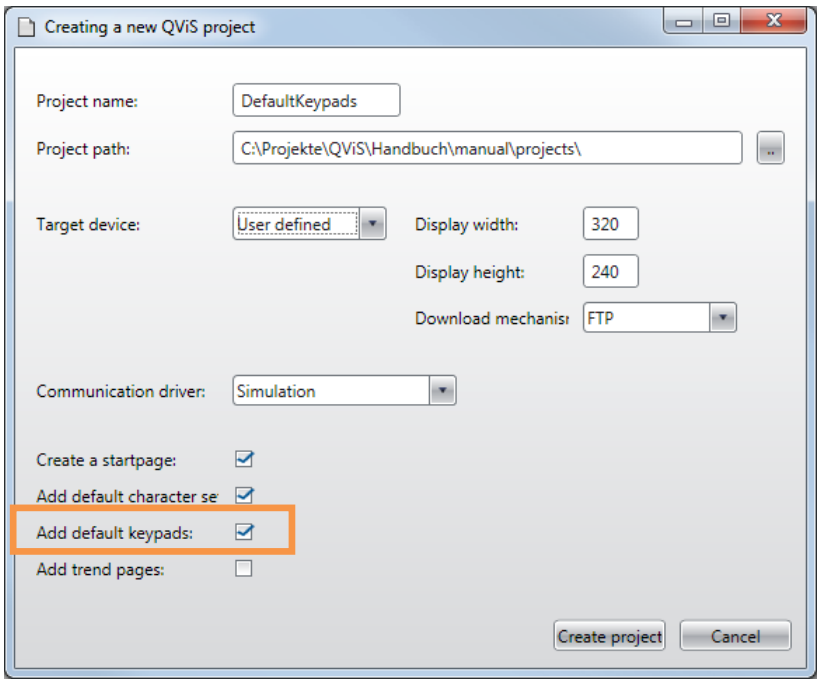
## 4.6.1 Using Default Keypads

**Task:**

The provided keypads (default keypads) are to be used.

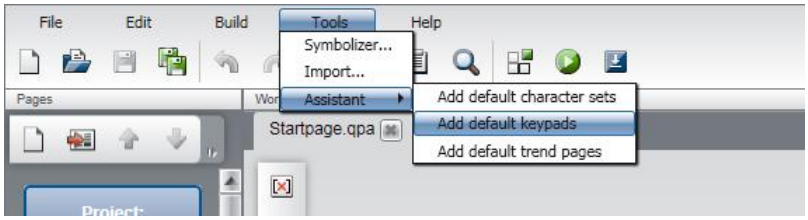
**Step 1a: Adding the default keypads when a new project is created**

When you create a new project, you can activate the option "Add default keypads" in the Project Assistant:




**Step 1b: Adding the default keypads in an existing project**

In the menu, select "Tools," "Assistant," "Add default keypads":





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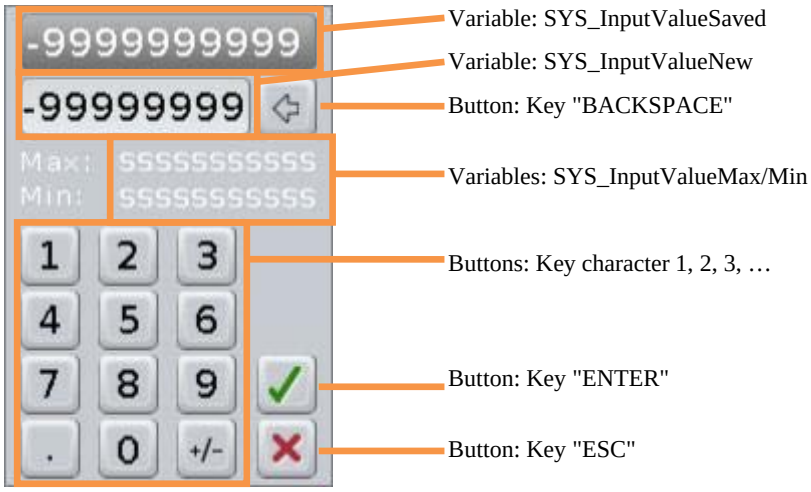
## 4.6.2 Creating Your Own Keypads

**Task:**

User-defined keypads (input window) are to be created.

Step 1: Numeric input window (numeric keypad)

Create a new page. Add the following elements:

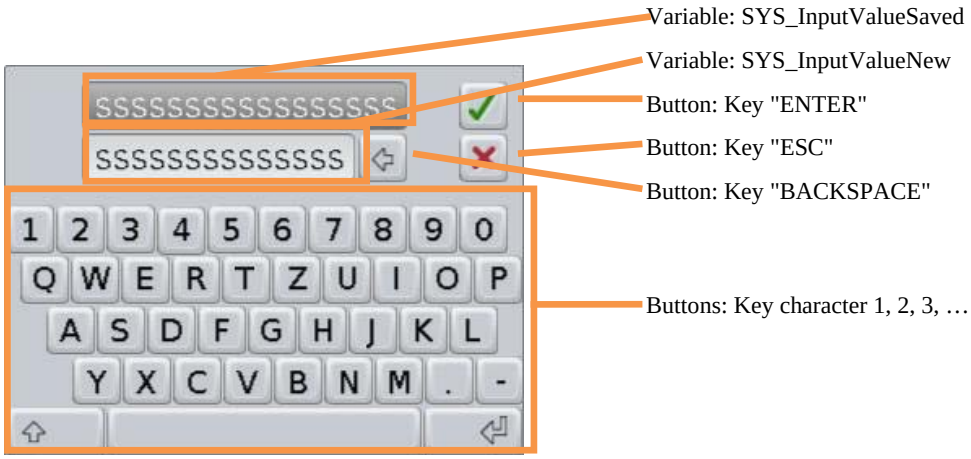



**Note:**

The size and background color for each page can be individually adapted in the Properties for each page.

**Step 2: Alphanumeric input window (text keypad)**

Create a new page. Add the following elements:


SSSSSSSSSSSSSSSS
SSSSSSSSSSSSS
1 2 3 4 5 6 7 8 9 0
Q W E R T Z U I O P
A S D F G H J K L
Y X C V B N M . -
Variable: SYS_InputValueSaved
Variable: SYS_InputValueNew
Button: Key "ENTER"
Button: Key "ESC"
Button: Key "BACKSPACE"
Buttons: Key character 1, 2, 3, …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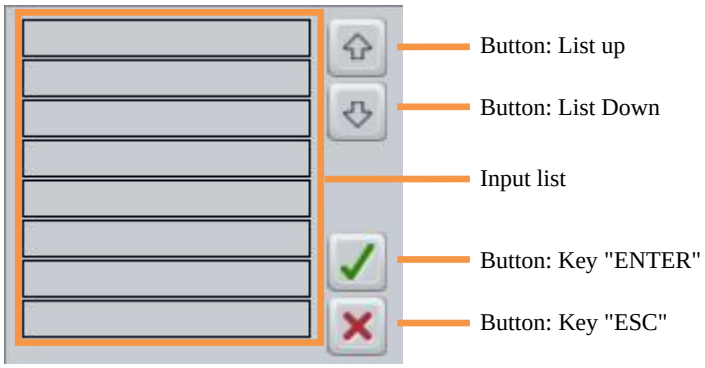
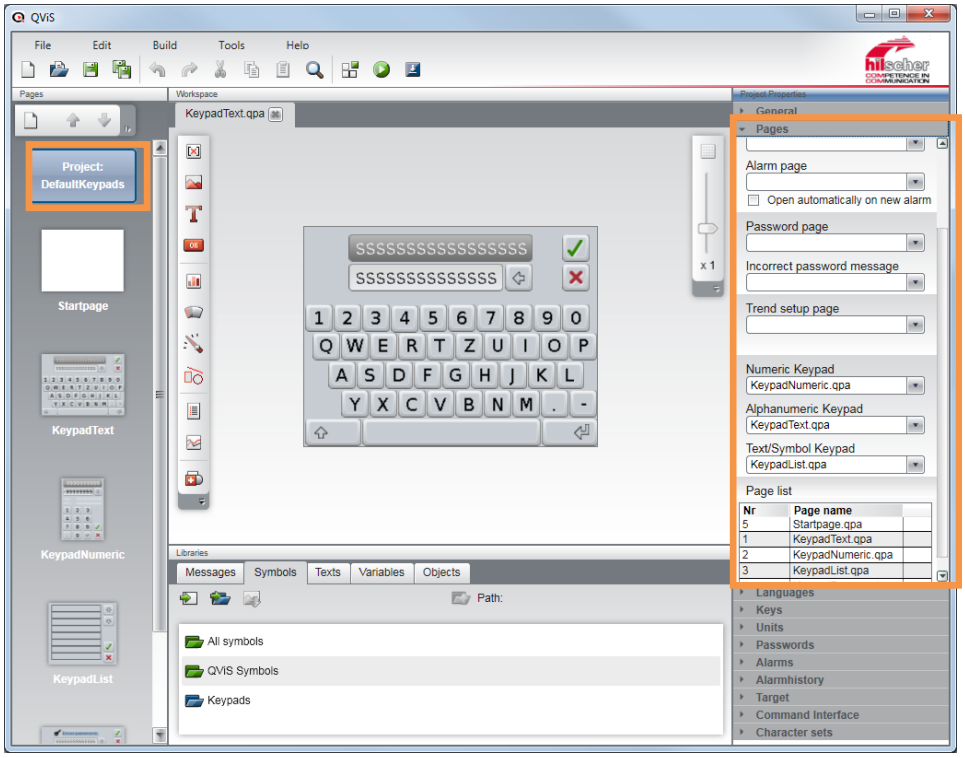
### Step 3: Selection window for texts and symbols (list keypad)

Create a new page. Add the following elements:




### Step 4: Allocating keypads

Open Project Properties and allocate the pages:





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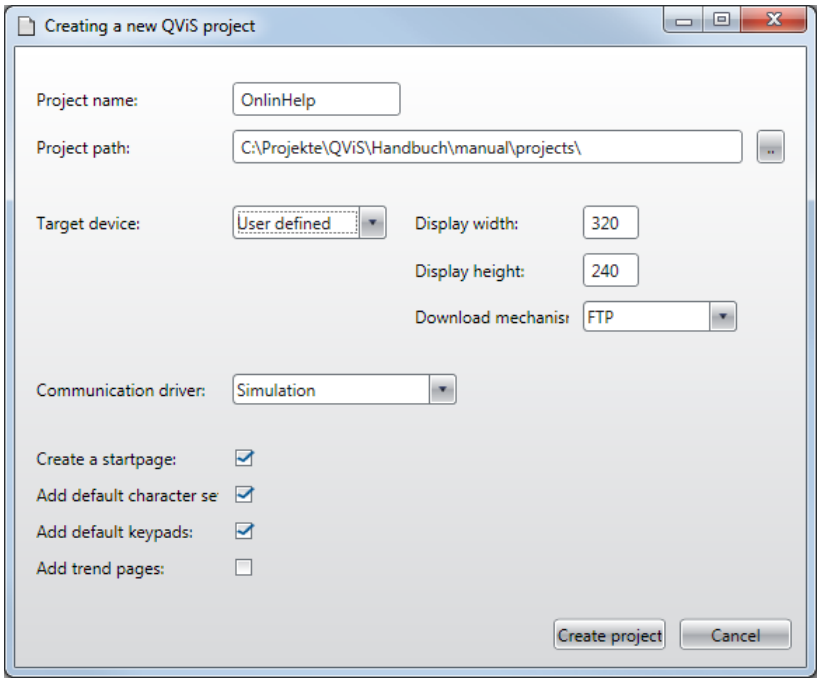
# 4.7 Online Help

**Task:**

- A page is to have numerous elements.
- The Help Mode can be activated.
- When the Help Mode is activated, a Help page containing appropriate help text is to be displayed when clicking onto an element.

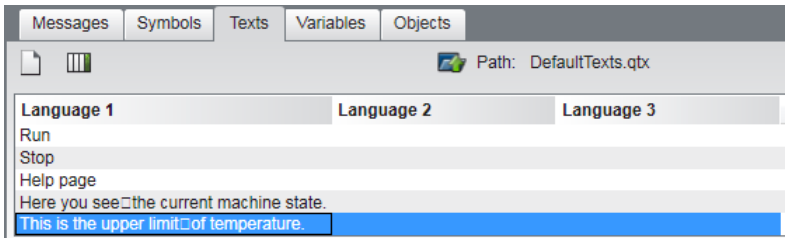
### Step 1: Create a new project

Create a new project (Menu File, New project…) and select the following settings:




### Step 2: Create texts

You now create the following texts:




**Note:**

Use the character string "\n" to insert a line break in the text.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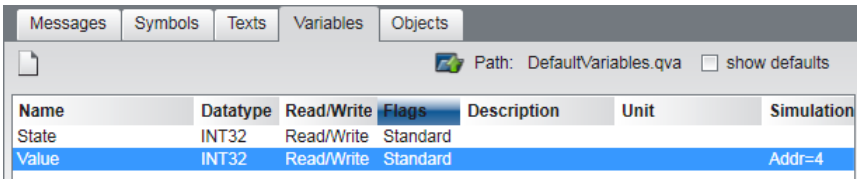
### Step 3: Create variables

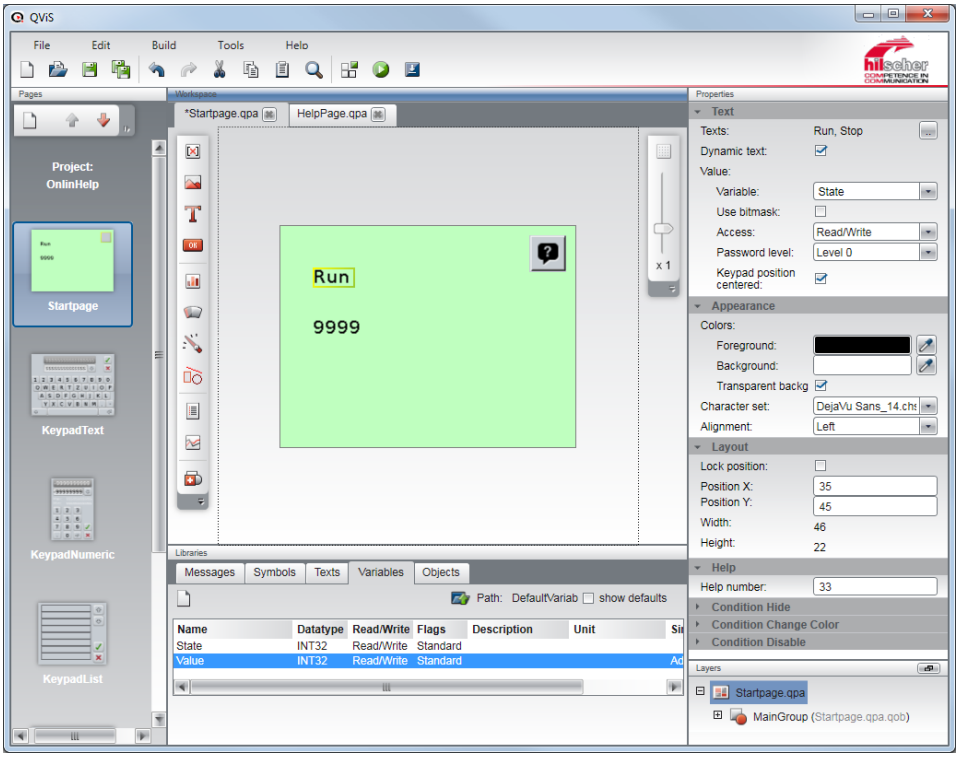
Create the following two variables:




| | | |
|---|---|---|
| State: | Data type: | INT32 |
| | Read/Write: | Read/Write |
| | Simulation, Address: | 0 |
| Value: | Data type: | INT32 |
| | Read/Write: | Read/Write |
| | Simulation, Address: | 4 |

### Step 4: Position the elements

Open the page "Startpage," and position a button to activate the help mode, a dynamic text and a variable:




| | | |
|---|---|---|
| Button | Function: | modify variable directly |
| | Variable: | SYS_HelpMode |
| | Style: | set – hold – reset |
| | Set value: | 1 |
| | Reset value: | 0 |
| Text | Dynamic text: | TRUE |
| | Variable: | State |
| | Texts: | 0 – 0: "Run" |
| | | 1 – 1: "Stop" |
| | Access: | Read/Write |
| | Help number: | 33 |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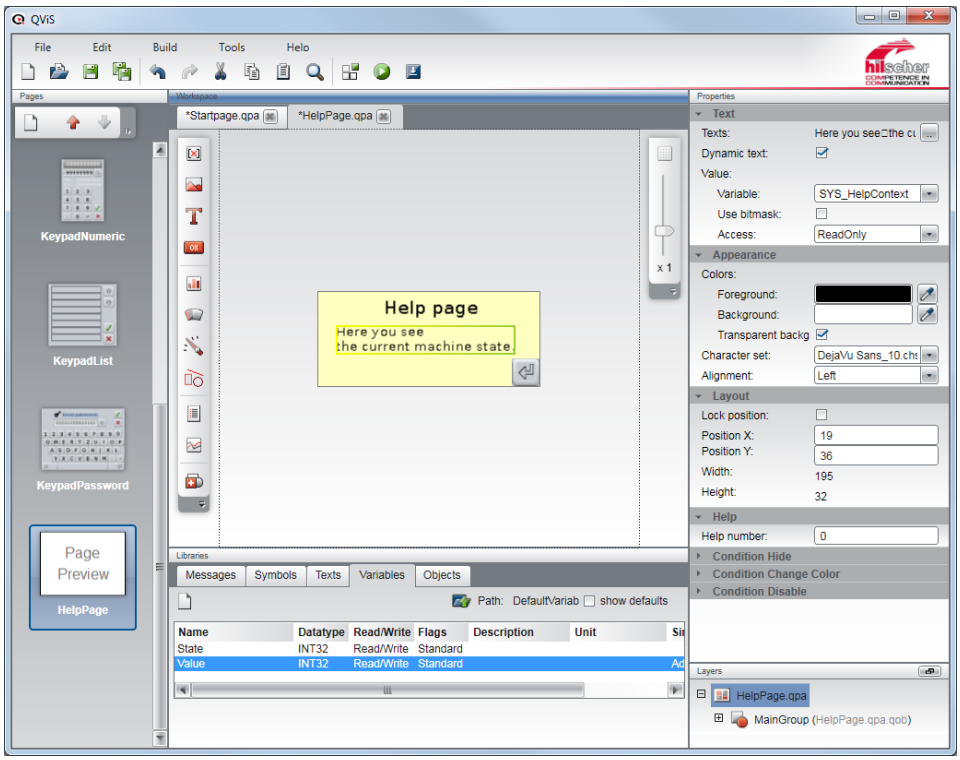
| | | |
|---|---|---|
| Variable | Variable: | Value |
| | Access: | Read/Write |
| | Pre decimal digits: | 4 |
| | Help number: | 44 |

**Step 5: Creating a Help Page**

- Create a new page, name it HelpPage and then open it.
- Downsize the page (e.g.,: Width=140, Height=100). Add the following elements




| | | |
|---|---|---|
| Text | Text: | Helppage |
| Text | Dynamic text: | TRUE |
| | Variable: | SYS_HelpContext |
| | Texts: | 33 – 33: "Here you see…" |
| | | 44 – 44: "This is the upper.." |
| Button | Function: | close overlay |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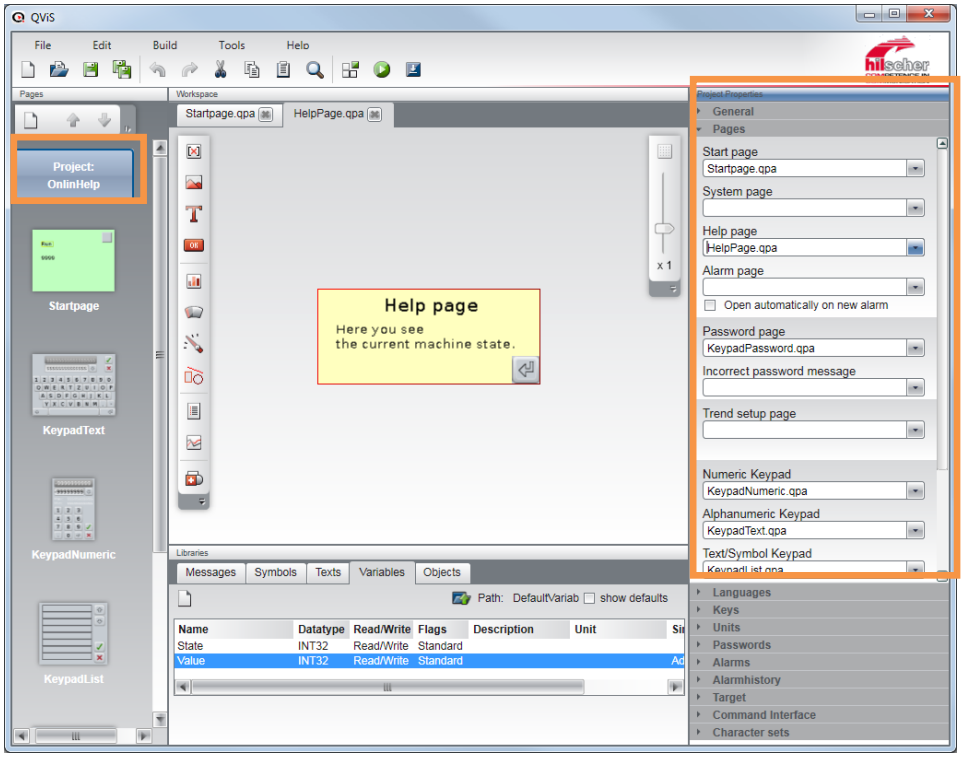
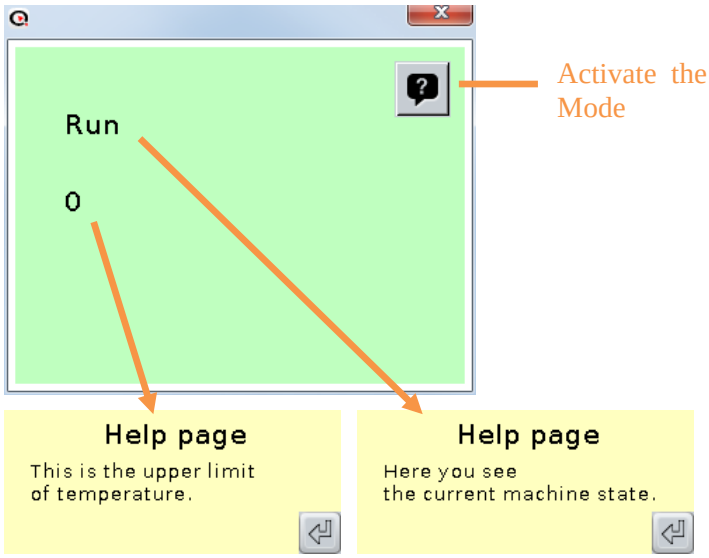
Save this page and in Project Properties, define this page as the Help page:




### Step 6: Build and simulate the project

Build the project and launch the simulation:

- You can activate the Help Mode with the right button
- When the Help Mode is activated, click onto one of the two elements
- The Help Page is opened and displays appropriate help text for the element





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# 4.8 Using and Creating Character Sets

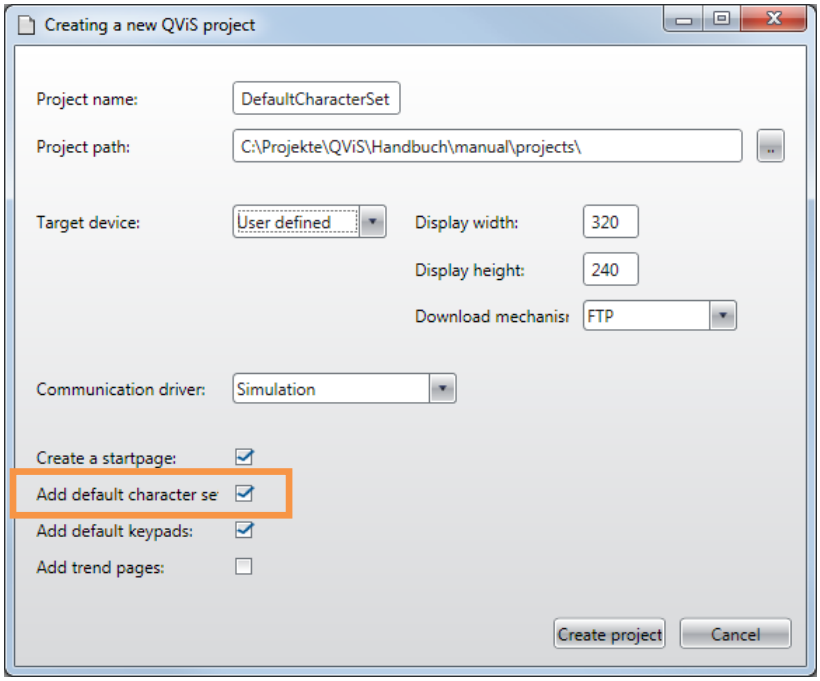
## 4.8.1 Using Default Character Sets

**Task:**

The provided character sets are to be used.

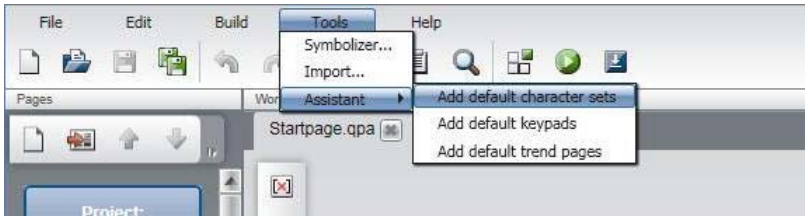
**Step 1a: Adding the default character sets when a new project is created**

When you create a new project, you can activate the option "Add default character sets" in the Project Assistant:




**Step 1b: Adding the default character sets in an existing project**

In the menu, select "Tools," "Assistant," "Add default character sets":





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## 4.8.2 Creating a Character Set

**Task:**

A new QViS character set (font) is to be created

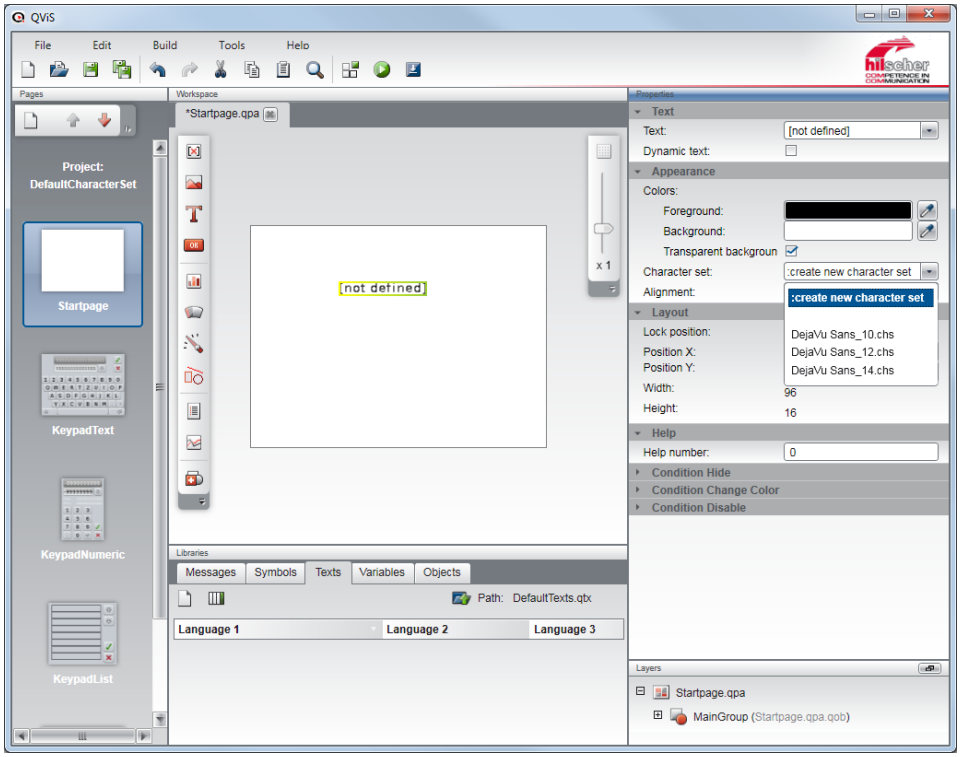
**Step 1: Creating a Character Set (QViS Character Set)**

Select an element that uses a character set (e.g., Text) and then select ":create new character set" under Property Character set .

**Note:**

As a rule, fonts installed on a PC are copyright-protected and therefore, may not be converted in QViS character sets.

There are copyright-free fonts that can be obtained via the Internet. Moreover, many companies have their own fonts, which they use for their Corporate Identity.




Subsequently, a window will open. Here you select the desired font, style and size (e.g. Font: Levenim MT, Size: 14, Style: Bold):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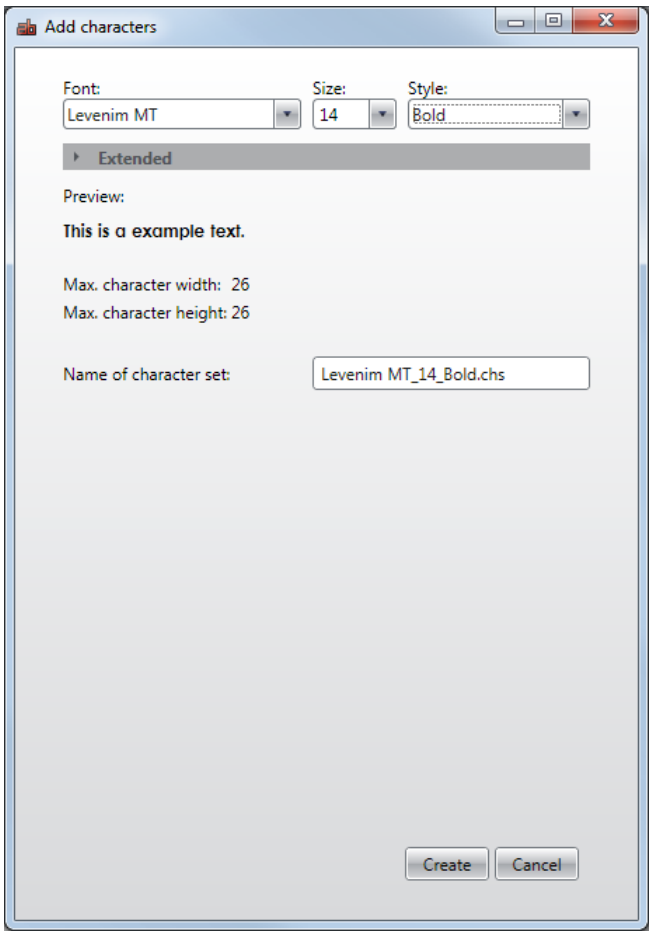


When you open the expander "Expended," you can specify which code page or Unicode range the character set to be created should contain. This must be particularly taken into consideration for all non-Latin character sets:


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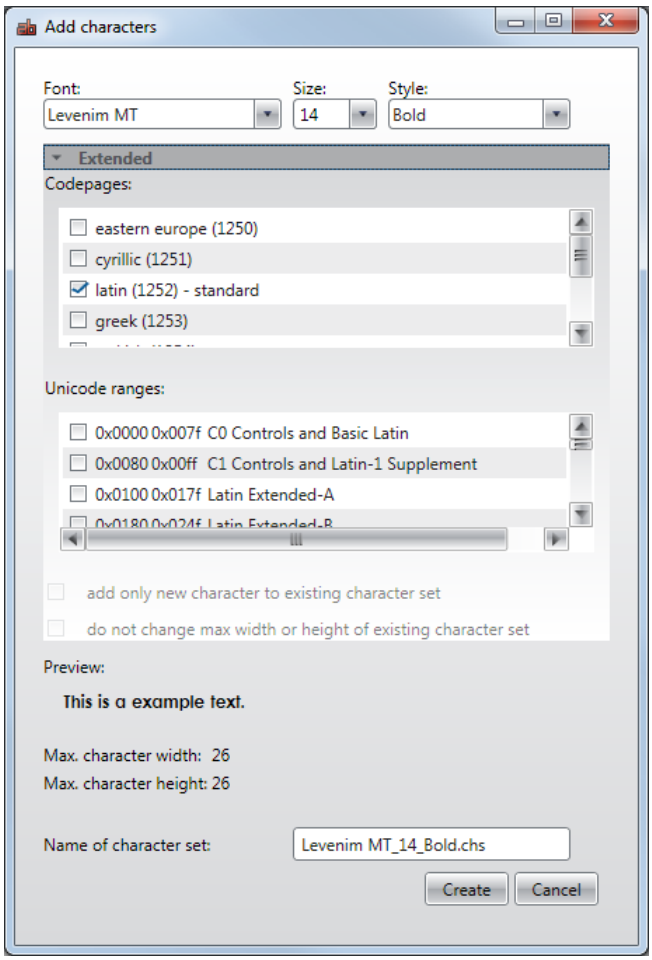


**Note:**

The "code pages" listed here are, as ANSI Code Pages, internationally standardized and contain a subset of possible characters.

As a rule, for Western Europe "Latin (1252)" (West European Latin) is used. In contrast, for Eastern Europe "eastern europe (1250)" (Central and East European Latin).

**Note:**

Not all characters needed are contained in the code pages. To nonetheless be about to display characters comprised in Unicode, there is the option of selecting Unicode ranges" for import.

Depending on the range, e.g., all Chinese characters are included.

**Note:**

All fonts available do not necessarily contain all characters available. Please contact the font supplier to learn the details on the extent of the desired font.


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When you subsequently hit "Create," a note is displayed in regard to potential breach of copyright. Should you own the copyright license and answer the question with "Yes," the character set will be created.

Avoid breaking copyright rules
You make a copy of a font or parts of this font and convert it to a QViS character set. Please keep in mind, that fonts have different licences. Check licence of font to avoid breaking copyright rules! Do you like to continue creating the character set?
Yes
No

If a character set with this name is already existent, it will be replaced.

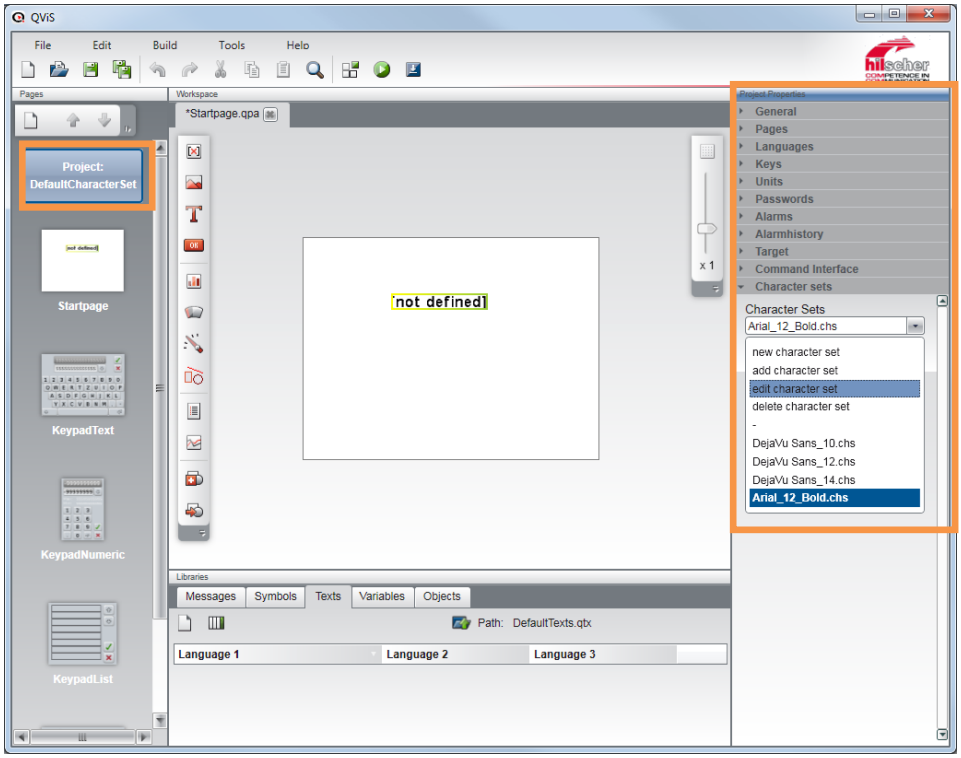
## 4.8.3 Adding Chinese Characters

**Task:**

- An existing QViS character set (font) is to be expanded with Chinese characters.
- A text with Chinese characters is to be displayed on the Start Page.

### Step 1: Expanding the character set

Open Project Properties and select your character set in Expander Character sets:




Select "edit character set."

The character set will be opened in the work space.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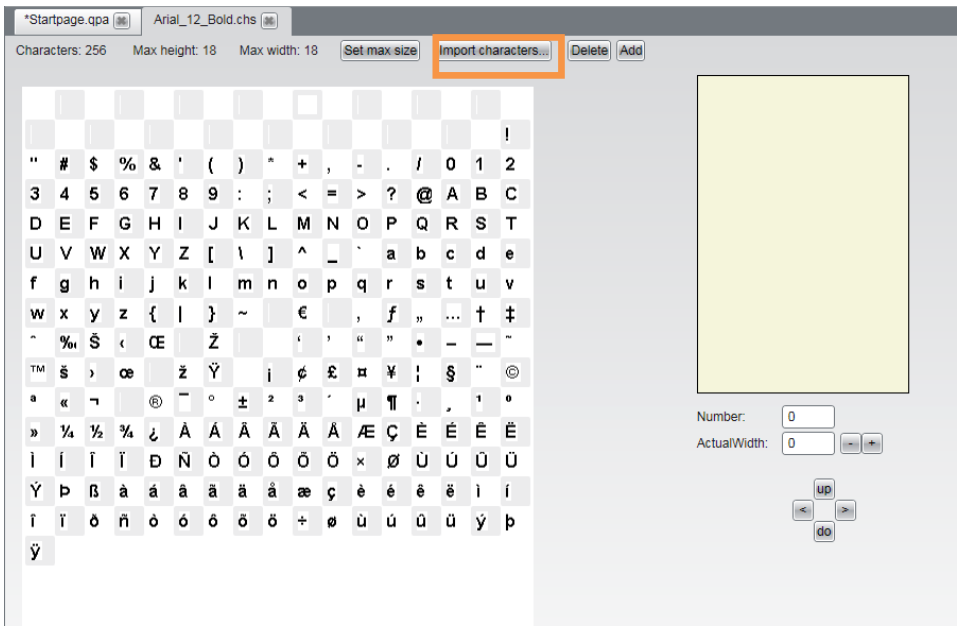
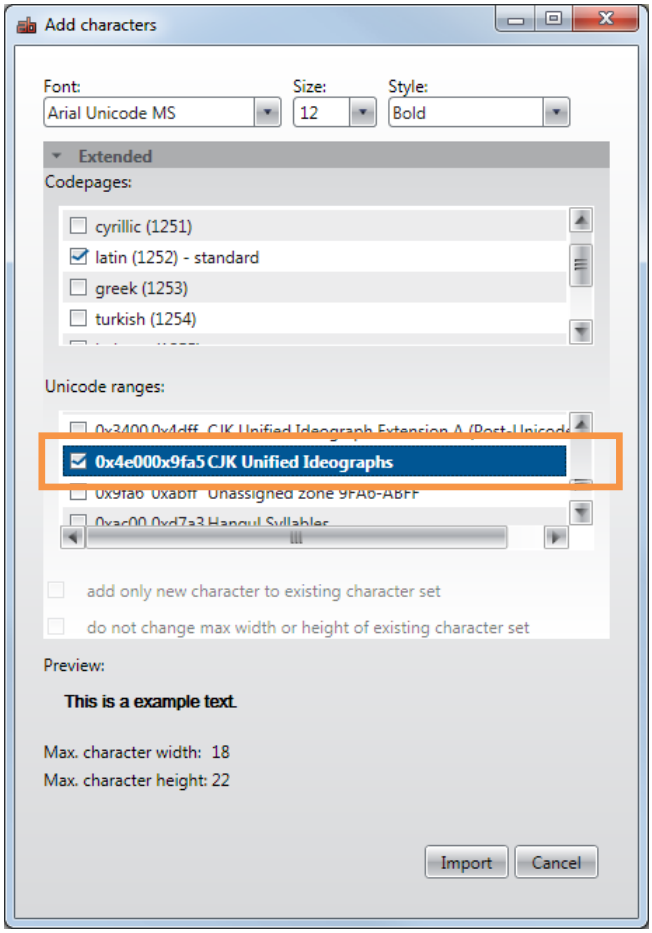



You can now select "Import characters…" to import a new character.

Select a font with Chinese characters (e.g., "Arial Unicode MS") and then select the range "0x4e00 0x9fa5 CJK Unified Ideographs" and click onto the button Import.





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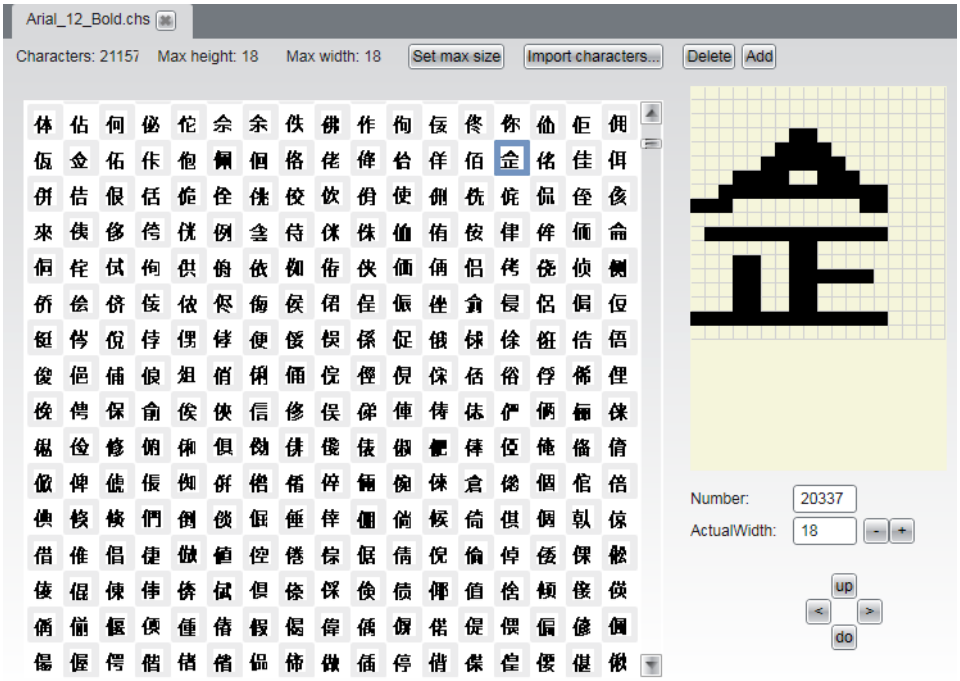
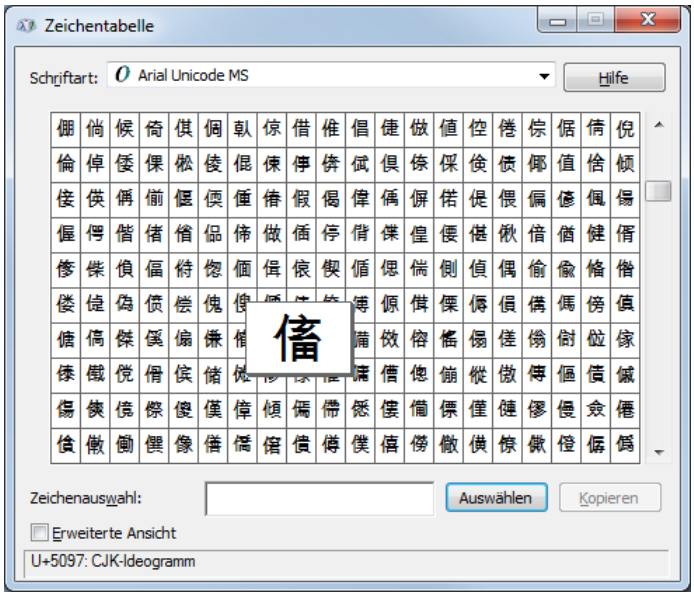
**Note:**

When selecting a large Unicode range, both the selection itself and the import can entail prolonged waiting periods




### Step 2: Displaying Chinese texts

Insert a text, which in the first language is "Welcome!" and in the second language, has a Chinese character. Since input with a "non-Chinese" computer is not simple, we use the symbol table: "Windows Start Menu" → "Program" → "Accessories" → "Systems Program" → Character Table:





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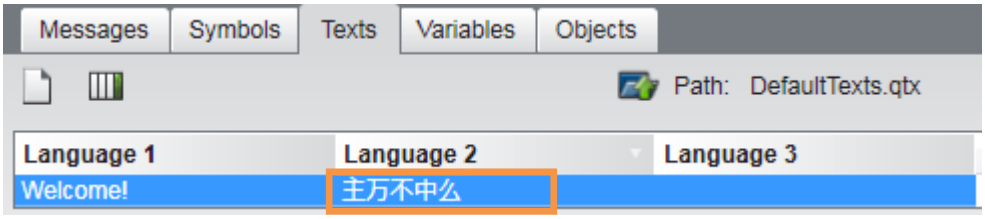
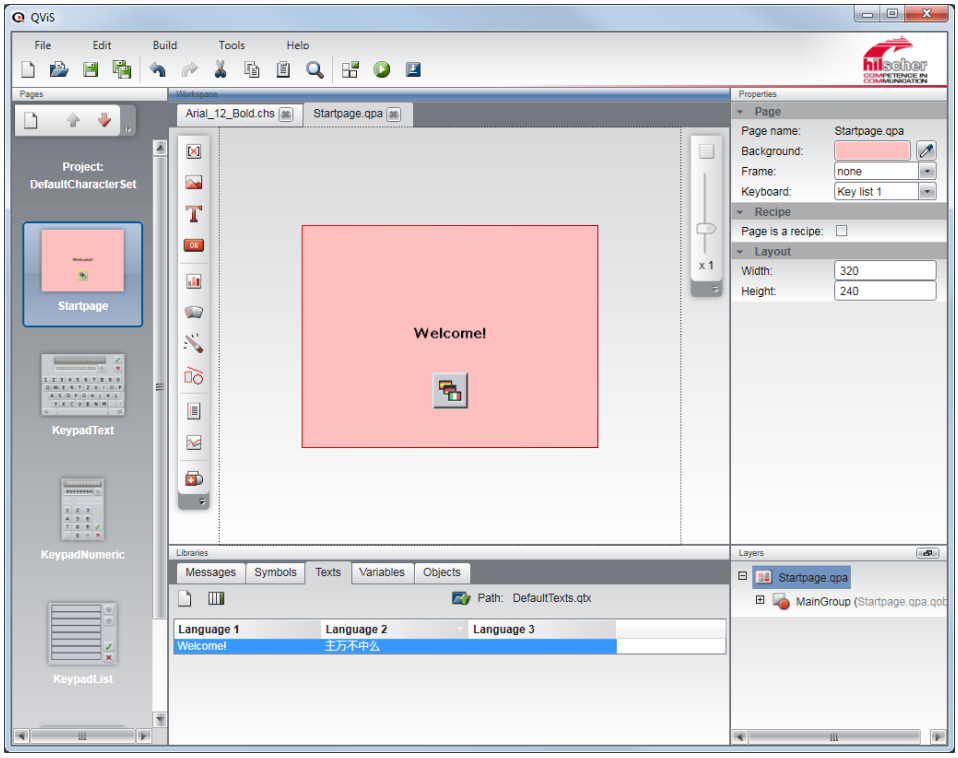
Select a few characters and copy them to QViS. Depending on the operating system, these will be displayed as rectangles in the text list, because the standard font display does not recognize Chinese characters:




### Step 3: Adding text in the project

Insert an element "Text" in a page and display this text. Position a button below it for switching languages:




| | | |
|---|---|---|
| Text | Text: | Welcome! |
| | Character set: | Arial_12_Bold.chs |
| | Alignment: | Center |
| Button | Function: | modify variable directly |
| | Variable: | SYS_LanguageNr |
| | Style: | set - hold - reset |
| | Set value: | 1 |
| | Reset value: | 0 |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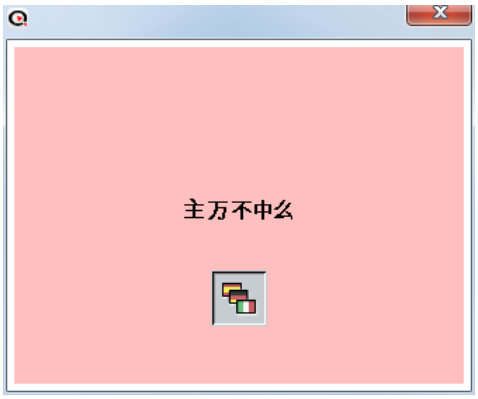
**Step 4: Build and simulate the project**

Build the project and launch the simulation:




You change languages by clicking onto the button.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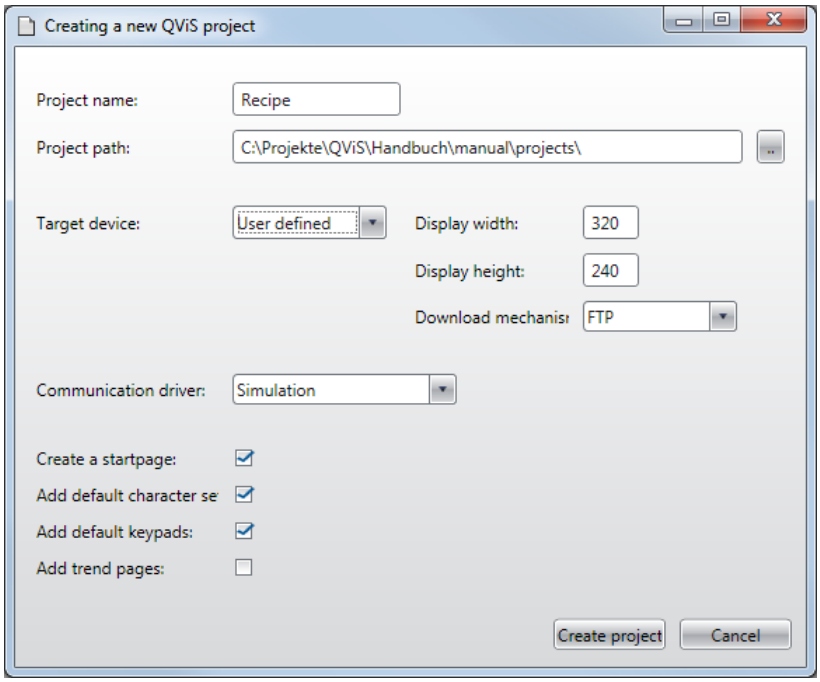
# 4.9 Managing Recipes

**Task:**

- Create a recipe in which two nominal values are saved
- Users should be able to save, upload and delete the recipe

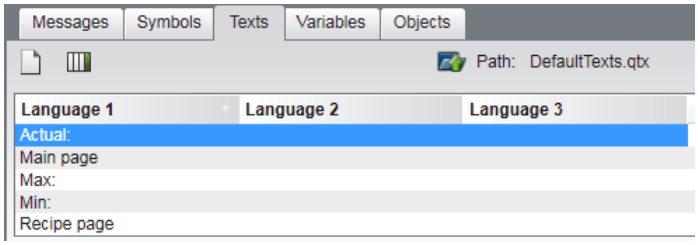
### Step 1: Create a new project

Create a new project (Menu File, New project…) and select the following settings:



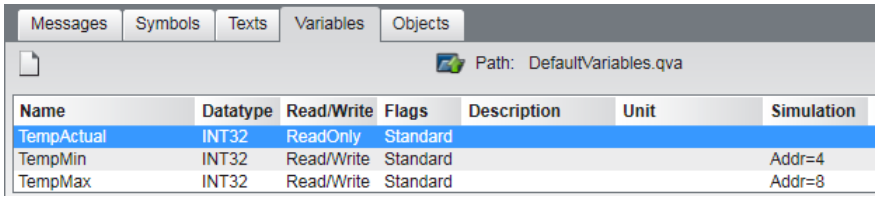

### Step 2: Create texts

You now create the following texts:




### Step 3: Create variables

Create the following two variables:




| | | |
|---|---|---|
| TempActual: | Data type: | INT32 |
| | Read/Write: | ReadOnly |
| | Simulation Address: | 0 |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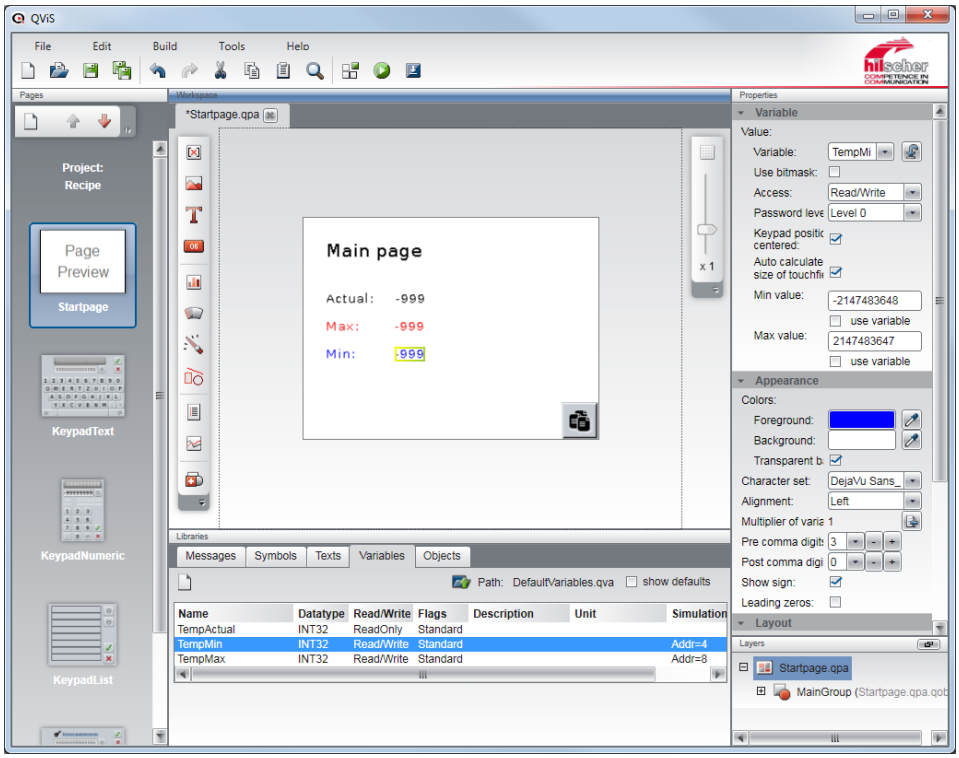
| | | |
|---|---|---|
| TempMin: | Data type:<br>Read/Write:<br>Simulation-Address: | INT32<br>Read/Write<br>4 |
| TempMax: | Data type:<br>Read/Write:<br>Simulation Address: | INT32<br>Read/Write<br>8 |

**Step 4: Creating a main page**

Open the page "Startpage" and position three variables:




| | | |
|---|---|---|
| Variable | Variable:<br>Pre decimal digits:<br>Access:<br>(actually, ReadOnly would be correct, but we select Read/Write for this example) | TempActual<br>3<br>Read/Write |
| Variable | Variable:<br>Pre decimal digits:<br>Access: | TempMax<br>3<br>Read/Write |
| Variable | Variable:<br>Pre decimal digits:<br>Access: | TempMin<br>3<br>Read/Write |
| Texts | Texts: | "Main page",<br>"Actual",<br>"Max",<br>"Min" |
| Button | Function:<br>Page: | Change to page<br>(will initially remain empty) |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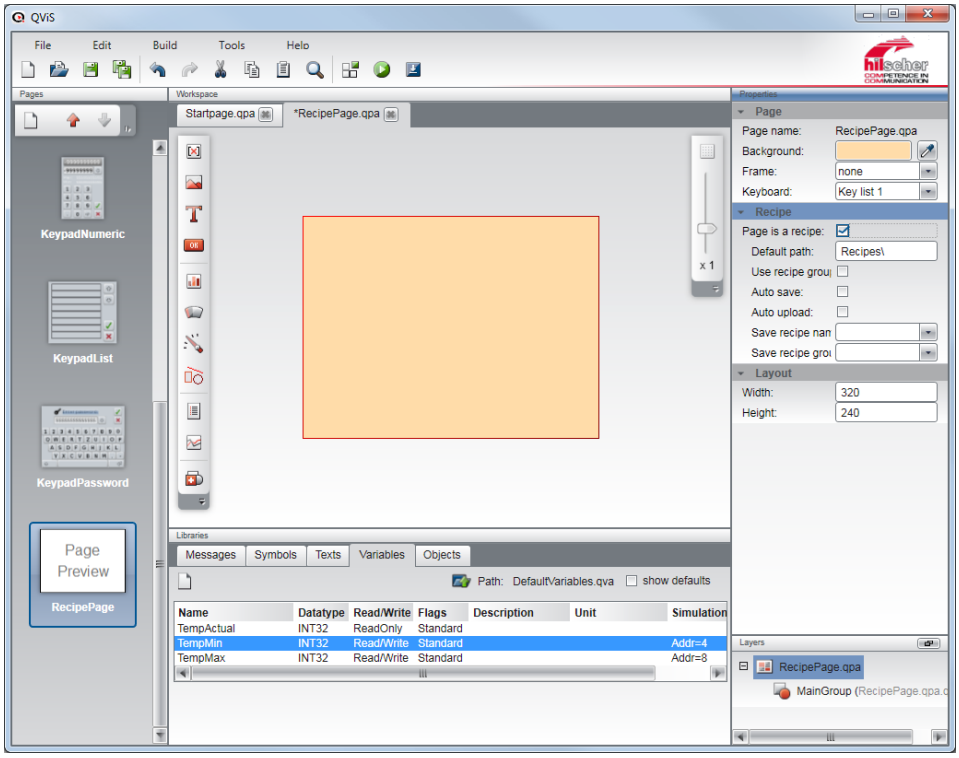
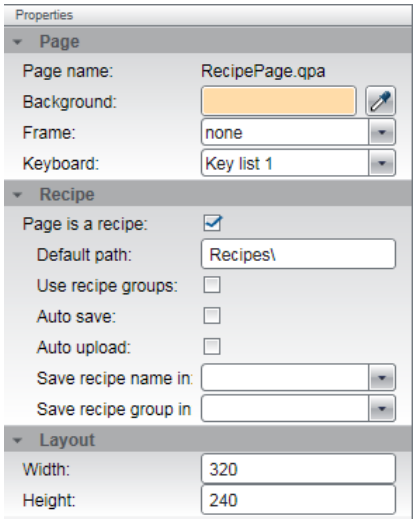
### Step 5: Creating a recipe page

Create a new page with the name "RecipePage" and open it:

Activate the option "Page is a recipe" in the Page Properties and if necessary, define a recipe path (default path):




Page is a recipe: Here it is defined whether the page is a recipe page. If yes, the parameters for the recipe page are displayed.

Default path: You can enter a folder here in which the recipe files are to be saved. If the field remains empty, the recipes are filed in the default path for recipes, which is stipulated in the configuration file QViSRT.cfg.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**Note:**

The specifications for the "Default path" are added to the preconfigured path with the key name "RecipeDefaultDir=" in the QViSRT.cfg of your QViS Runtime system.

Thus, only relative paths can be entered.

| | |
|---|---|
| Use recipe group: | If the recipe files are to be saved in groups, this must be checked in the Checkbox. Groups are sub-folders (e.g., "LightChocolate," "DarkChocolate") in the file system. |
| Auto save: | When the option "Auto save" has been selected, each change of a setpoint value (Read/Write variable) is automatically saved in the recipe file. It is not necessary to initiate storage via the "recipe save" function. |
| Auto upload: | When the option "Auto upload" is used, an upload (i.e., the control loads the values of the Read/Write variables) is automatically executed. It is not necessary to initiate an upload via the "recipe upload" function. |
| Save recipe name: | If a recipe download is performed, Type String saves the name of this recipe in the variables that have been set. |
| Save recipe group: | If a recipe download is performed, Type String stores the group of this recipe in the variables that have been set. |

Add the same three variables as on the start page. However, the variable TempActual receives the setting Access=ReadOnly. Furthermore, ad a variable for a recipe name:


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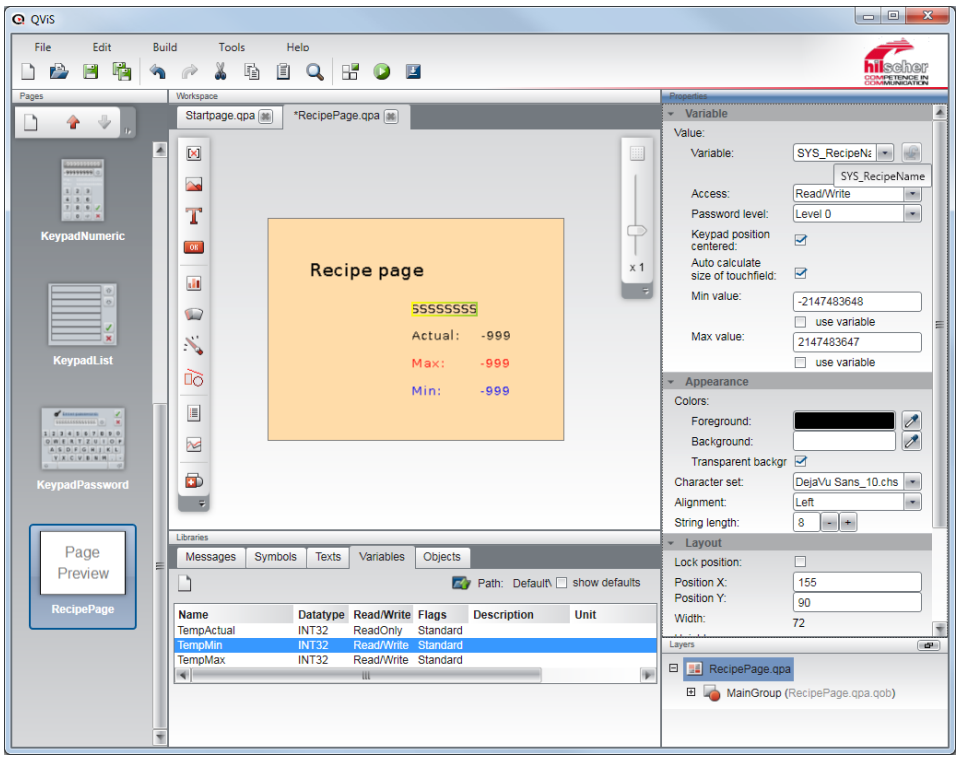


| | | |
|---|---|---|
| Variable | Variable:<br>Access: | TempActual<br>ReadOnly |
| Variable | Variable:<br>Access: | TempMax<br>Read/Write |
| Variable | Variable:<br>Access: | TempMin<br>Read/Write |
| Variable | Variable:<br>Access:<br>Format: | SYS_RecipeName<br>Read/Write<br>String |
| Texts | Texts: | "Recipe page",<br>"Actual",<br>"Max",<br>"Min" |


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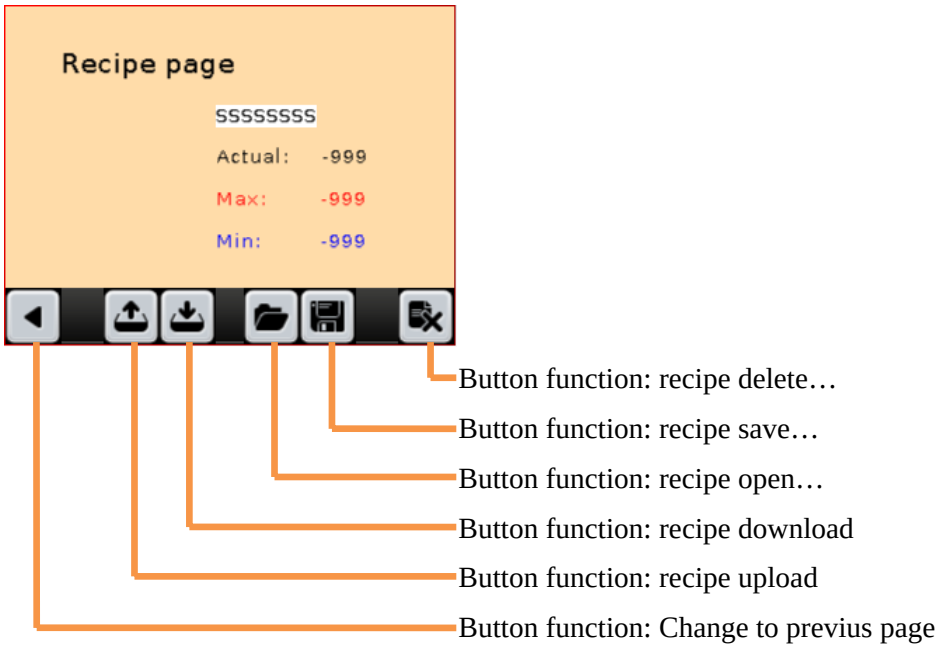
### Step 6: Add buttons

On the Recipe page, add the following buttons:



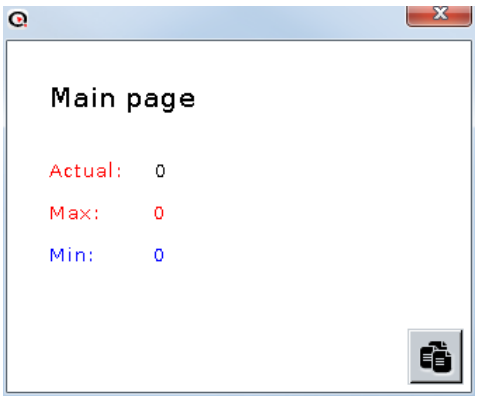

**Note:**

The symbols and page element used in this example are located in the Symbol Library (QViS Symbols) provided.

### Step 7: Build and simulate the project

Prior to building the project, you must first finish configuring the button on the start. Enter the target page "RecipePage" at the button so that users can also switch to the recipe page.

Build the project and launch the simulation:





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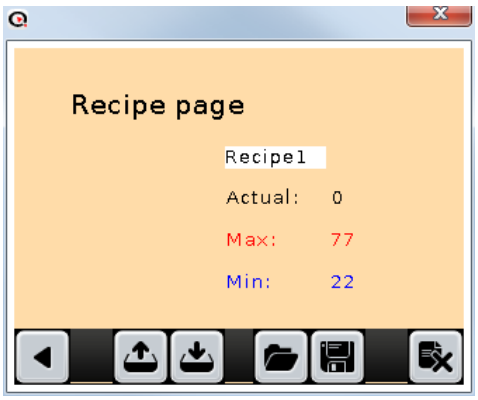


- If you change variable values on the main page, the variables are written in the usual manner.
- If you modify Read/Write variables on the recipe page, they are only changed locally and not truly written. They are not written until you click onto the download button.
- Read/Write variables are not continuously updated. The values are not read until you click onto the upload button.
- When you define a recipe name, the recipe can be saved and thereafter uploaded. All values of the Read/Write variables are saved in the recipe.


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# 4.10 Importing Variables

**Note:**

Please refer to the Application Note "QViS Driver Configuration" for further information on setting the individual communication drivers.

## 4.10.1 Import from CoDeSys V3 for Local Access

**Task:**

Users should be able to use variables from a CoDeSys project in QViS.

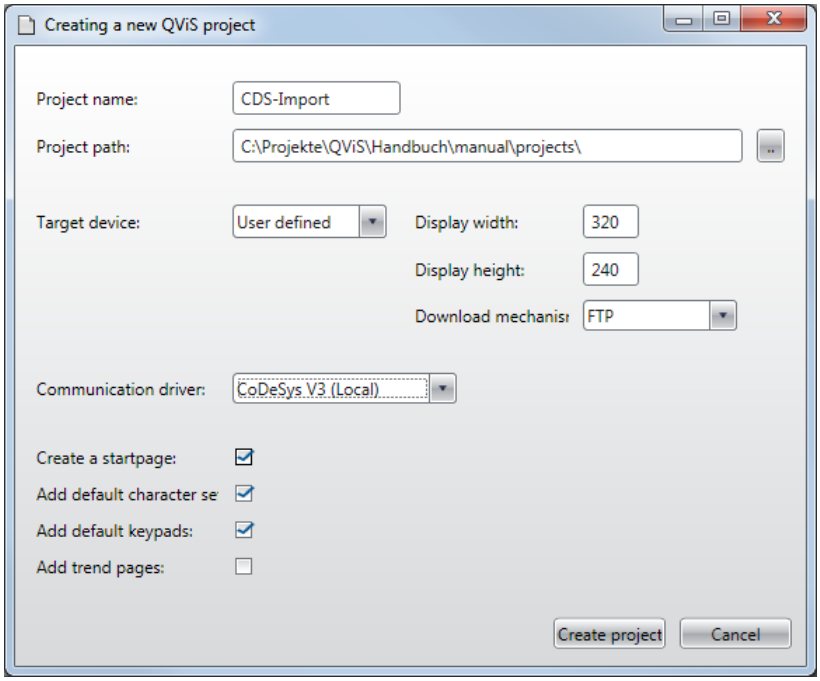
**Note:**

For the CoDeSys drivers available, there is a local and remote variant.

The import methods outlined here are applied when the runtimes from CoDeSys V3.x and QViS run on the same system.

**Step 1: Create a new project**

Create a new project (Menu File, New project…) and select the following settings:





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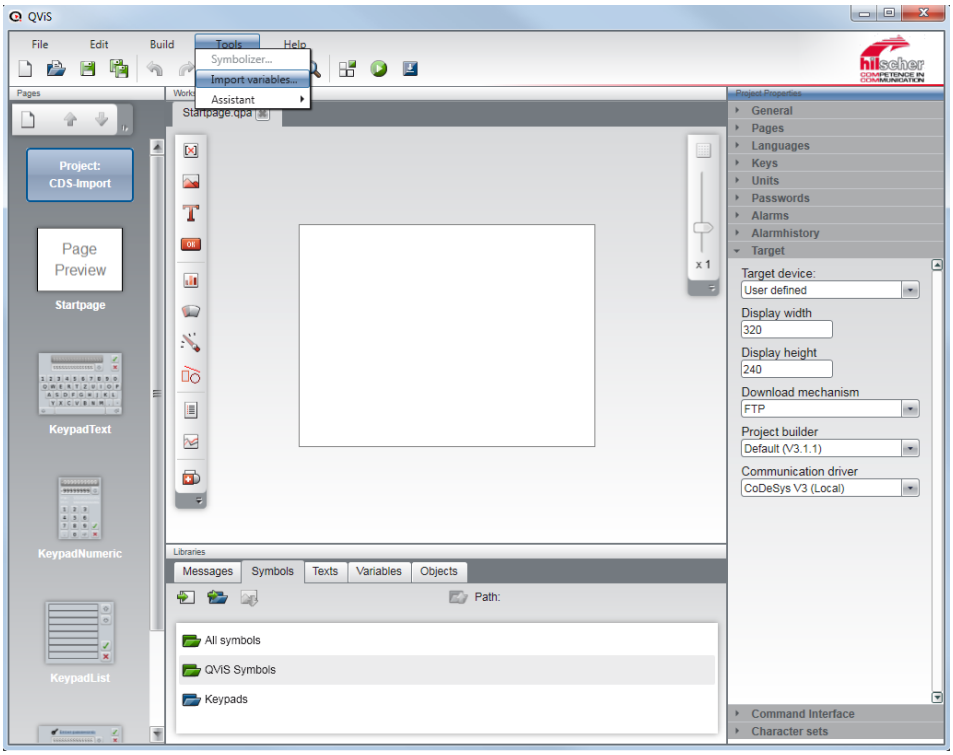
### Step 2: Open the XML created by CoDeSys with the Symbol/Variables Information

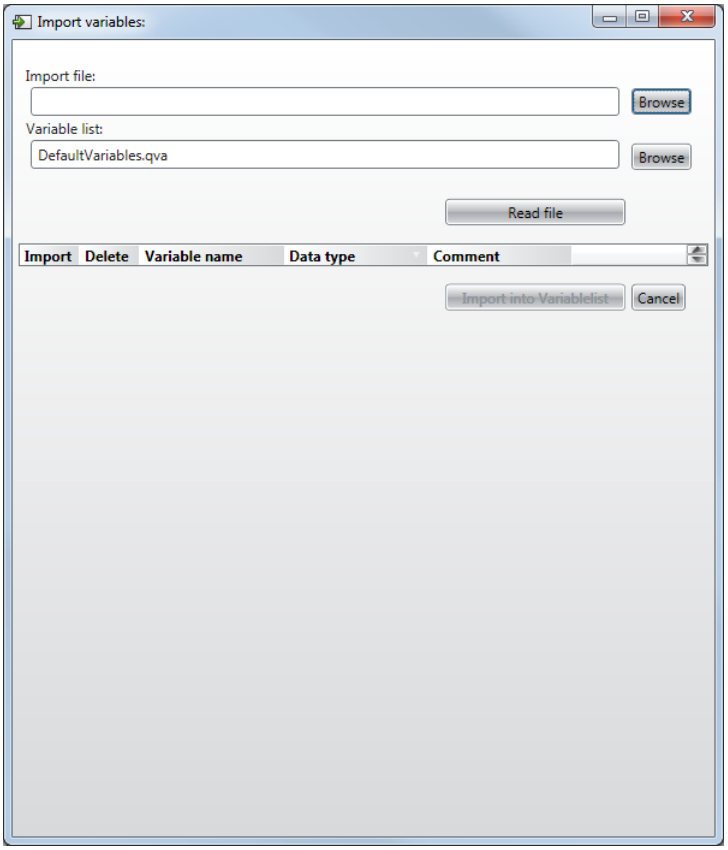
Open the Import Dialogue (Menu Tools, Import variables).




### Step 3: Select the Import file and variable list

Under "Import file:", enter or select the XML file from CoDeSys.

Under "Variable list:", enter or select the variable list.





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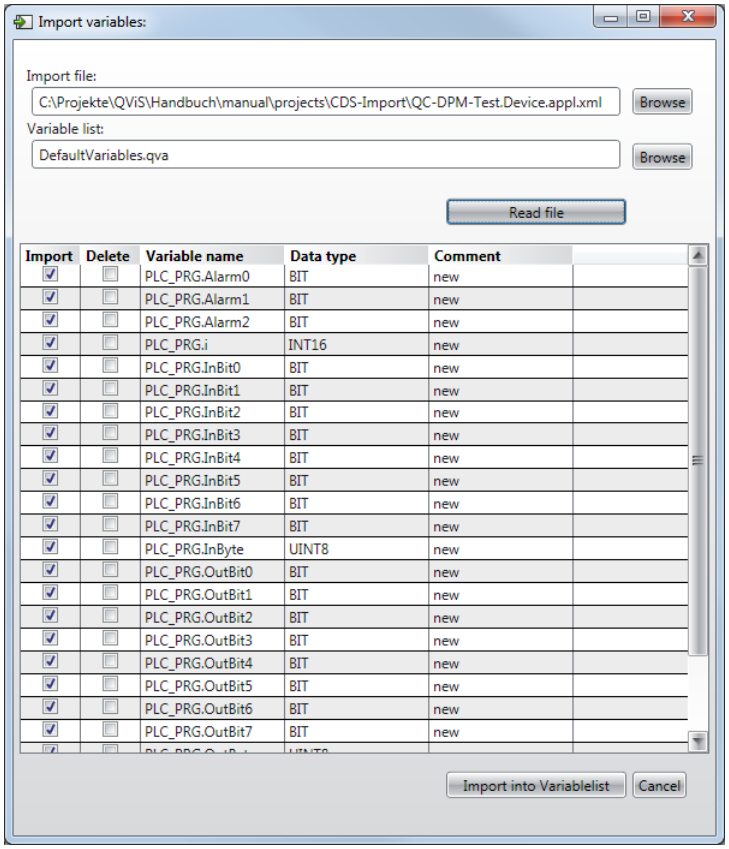
### Step 4: Display the selection list and choose the desired variables

By clicking onto "Read file", the XML file is read in and under "Comment", an overview of what will happen to each variable during import is displayed. Variables that are not desired can be deselected.




| Import | Delete | Variable name | Data type | Comment |
|---|---|---|---|---|
| ☑ | ☐ | PLC_PRG.Alarm0 | BIT | new |
| ☑ | ☐ | PLC_PRG.Alarm1 | BIT | new |
| ☑ | ☐ | PLC_PRG.Alarm2 | BIT | new |
| ☑ | ☐ | PLC_PRG.i | INT16 | new |
| ☑ | ☐ | PLC_PRG.InBit0 | BIT | new |
| ☑ | ☐ | PLC_PRG.InBit1 | BIT | new |
| ☑ | ☐ | PLC_PRG.InBit2 | BIT | new |
| ☑ | ☐ | PLC_PRG.InBit3 | BIT | new |
| ☑ | ☐ | PLC_PRG.InBit4 | BIT | new |
| ☑ | ☐ | PLC_PRG.InBit5 | BIT | new |
| ☑ | ☐ | PLC_PRG.InBit6 | BIT | new |
| ☑ | ☐ | PLC_PRG.InBit7 | BIT | new |
| ☑ | ☐ | PLC_PRG.InByte | UINT8 | new |
| ☑ | ☐ | PLC_PRG.OutBit0 | BIT | new |
| ☑ | ☐ | PLC_PRG.OutBit1 | BIT | new |
| ☑ | ☐ | PLC_PRG.OutBit2 | BIT | new |
| ☑ | ☐ | PLC_PRG.OutBit3 | BIT | new |
| ☑ | ☐ | PLC_PRG.OutBit4 | BIT | new |
| ☑ | ☐ | PLC_PRG.OutBit5 | BIT | new |
| ☑ | ☐ | PLC_PRG.OutBit6 | BIT | new |
| ☑ | ☐ | PLC_PRG.OutBit7 | BIT | new |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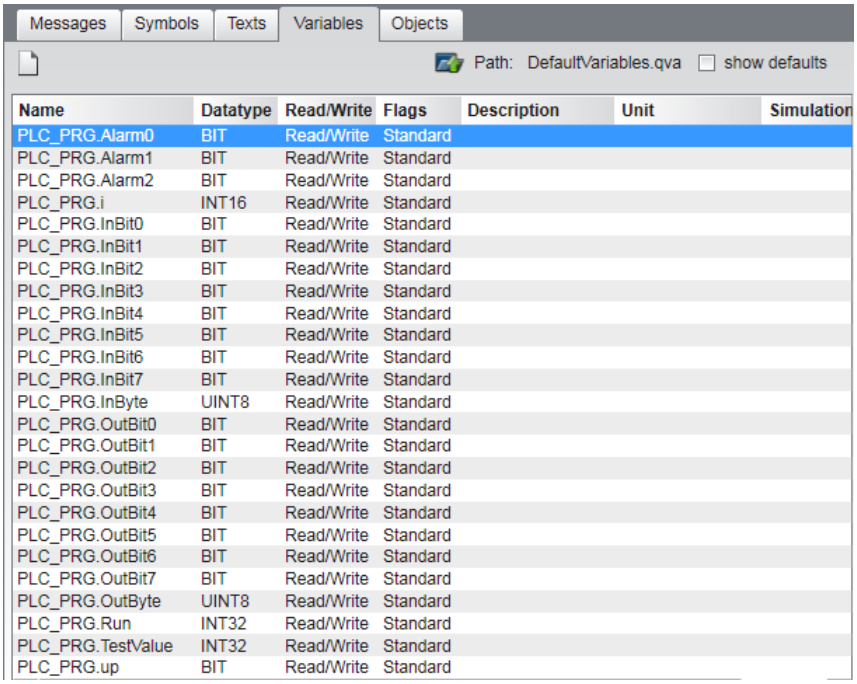
### Step 5: Take over the selected variables in the variable list

By clicking onto "Import into Variablelist", the selected variables are either taken over in the variable list or updated.




| Name | Datatype | Read/Write | Flags | Description | Unit | Simulation |
|---|---|---|---|---|---|---|
| PLC_PRG.Alarm0 | BIT | Read/Write | Standard | | | |
| PLC_PRG.Alarm1 | BIT | Read/Write | Standard | | | |
| PLC_PRG.Alarm2 | BIT | Read/Write | Standard | | | |
| PLC_PRG.i | INT16 | Read/Write | Standard | | | |
| PLC_PRG.InBit0 | BIT | Read/Write | Standard | | | |
| PLC_PRG.InBit1 | BIT | Read/Write | Standard | | | |
| PLC_PRG.InBit2 | BIT | Read/Write | Standard | | | |
| PLC_PRG.InBit3 | BIT | Read/Write | Standard | | | |
| PLC_PRG.InBit4 | BIT | Read/Write | Standard | | | |
| PLC_PRG.InBit5 | BIT | Read/Write | Standard | | | |
| PLC_PRG.InBit6 | BIT | Read/Write | Standard | | | |
| PLC_PRG.InBit7 | BIT | Read/Write | Standard | | | |
| PLC_PRG.InByte | UINT8 | Read/Write | Standard | | | |
| PLC_PRG.OutBit0 | BIT | Read/Write | Standard | | | |
| PLC_PRG.OutBit1 | BIT | Read/Write | Standard | | | |
| PLC_PRG.OutBit2 | BIT | Read/Write | Standard | | | |
| PLC_PRG.OutBit3 | BIT | Read/Write | Standard | | | |
| PLC_PRG.OutBit4 | BIT | Read/Write | Standard | | | |
| PLC_PRG.OutBit5 | BIT | Read/Write | Standard | | | |
| PLC_PRG.OutBit6 | BIT | Read/Write | Standard | | | |
| PLC_PRG.OutBit7 | BIT | Read/Write | Standard | | | |
| PLC_PRG.OutByte | UINT8 | Read/Write | Standard | | | |
| PLC_PRG.Run | INT32 | Read/Write | Standard | | | |
| PLC_PRG.TestValue | INT32 | Read/Write | Standard | | | |
| PLC_PRG.up | BIT | Read/Write | Standard | | | |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## 4.10.2 Importing via the Symbolyzer

**Task:**

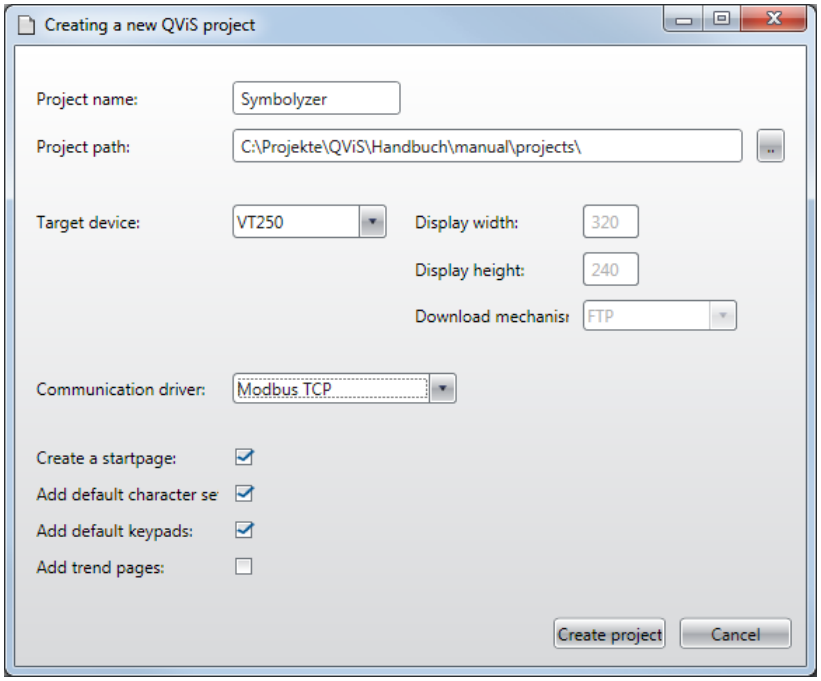
Variables are to be created and imported in QViS via the practically bus system-independent Symbolyzer.

**Note:**

Configuring variables is performed in the same manner for all supported drivers. Depending on the fieldbus, however, the properties of the variables are parameterized.

**Step 1: Create a new project**

Create a new project (Menu File, New project…) and select the following settings:





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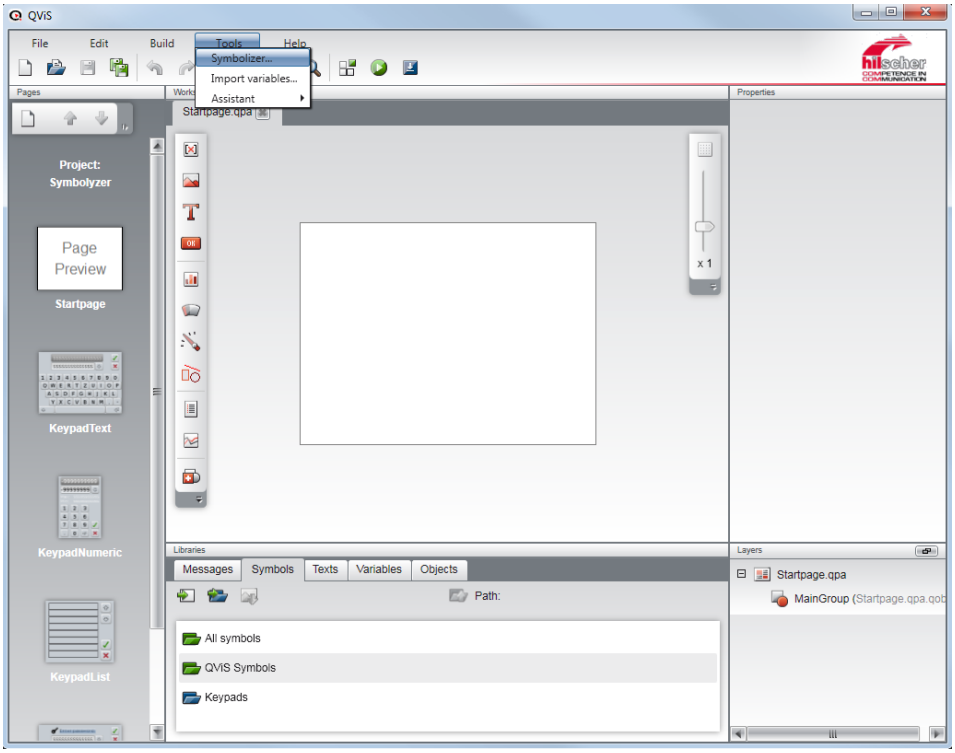
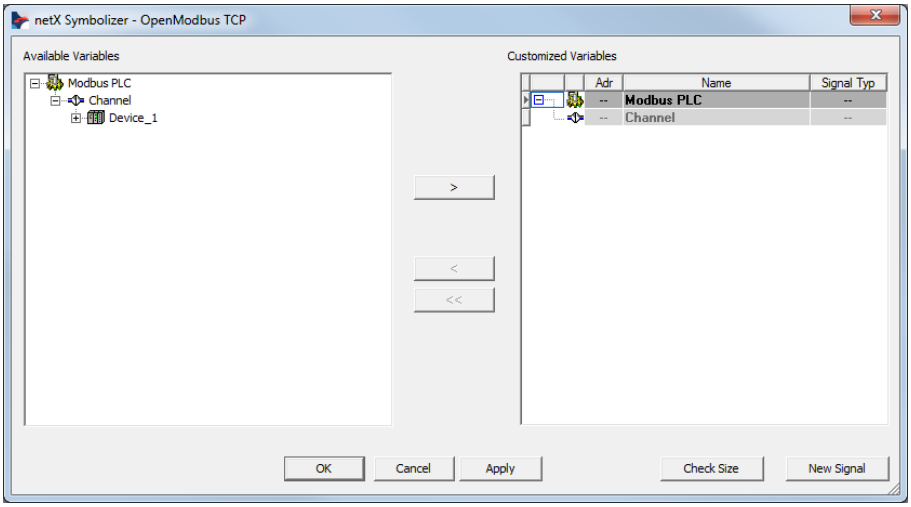
### Step 2: Launching the Symbolyzer

Open the Import Dialogue (Menu Tools, Import variables, Symbolyzer).




### Step 3: Accessing the PDI Editor via the Symbolyzer

When the netX Symbolyzer is launched, you can access the PDI Editor via "New Signal," in which you can create a device featuring all the desired modules and signals.





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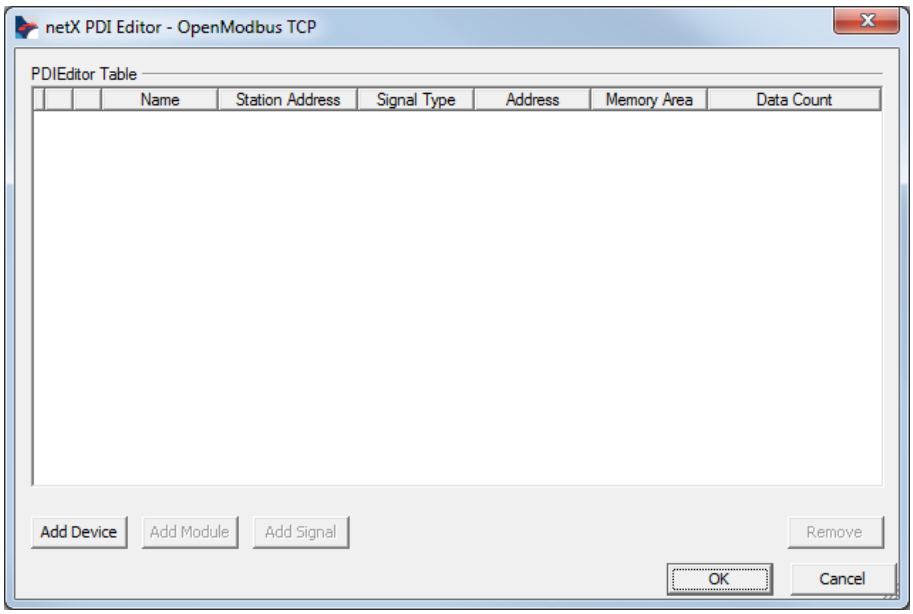
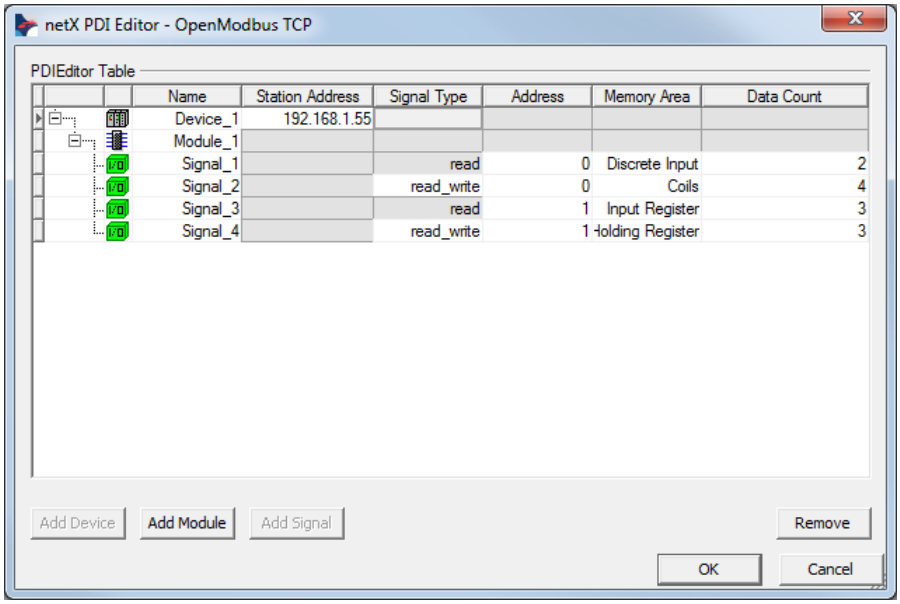



**Step 4: Creating devices, modules and signals:**

One device, max., numerous modules and signals (variables) under the module can now be parameterized.




**Note:**

Depending on the selected fieldbus driver (in this case, Modbus/TCP), different setting options are available in the PDI Editor (e.g., target address, data type, Read/Write access, offsets, etc.).

**Note:**

Per default, all access mechanisms are set to ReadOnly, when the selected fieldbus permits it.

Where applicable, write rights must be set for the respective signals.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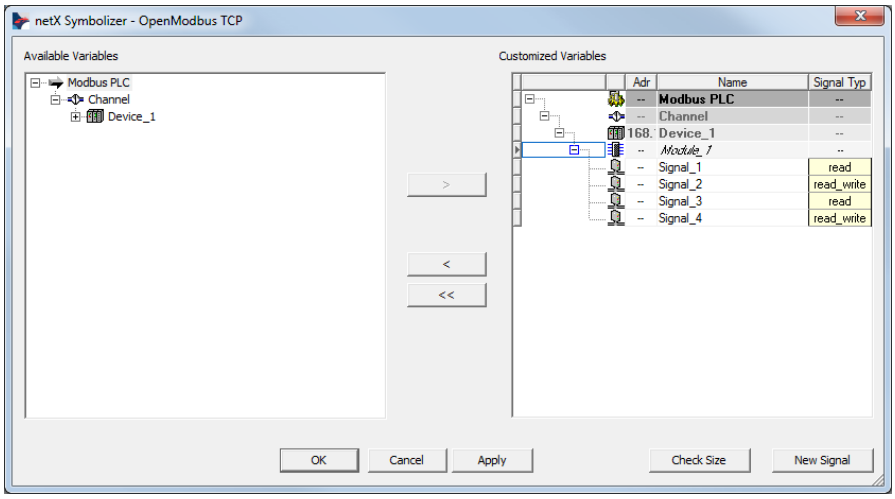
### Step 5: Quitting the Symbolyzer

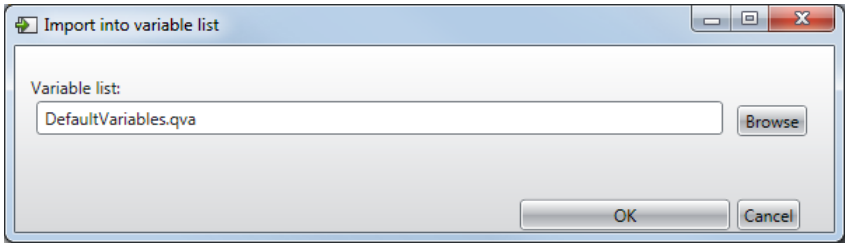
The Symbolyzer can be closed after quitting the PDI Editor via "OK" or "Cancel."



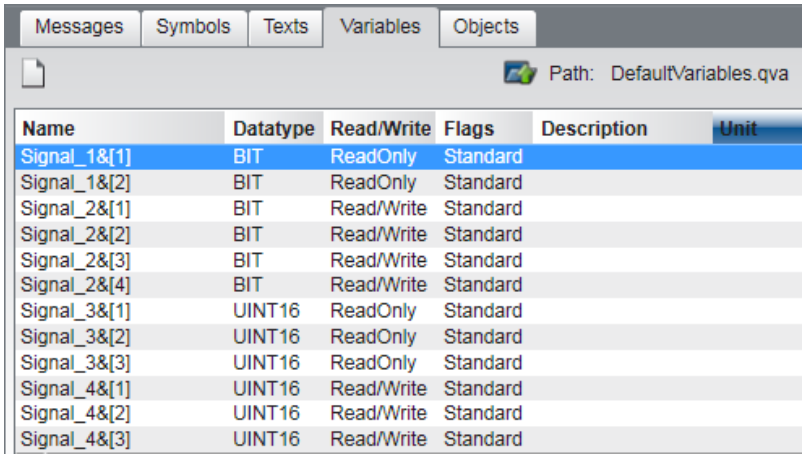

When closing the Symbolyzer, a rudimentary plausibility check is performed. If, for example, the user forgot to enter a target address, an error message containing explanatory information is displayed.

### Step 6: Take over all variables

In the last step, you have the option of saving the variables in a desired QViS variable table (file extension *.qva). "DefaultVariables.qva" is offered as the default.




### Step 7: The variables are now available in QViS




| Name | Datatype | Read/Write | Flags | Description | Unit |
|---|---|---|---|---|---|
| Signal_1&[1] | BIT | ReadOnly | Standard | | |
| Signal_1&[2] | BIT | ReadOnly | Standard | | |
| Signal_2&[1] | BIT | Read/Write | Standard | | |
| Signal_2&[2] | BIT | Read/Write | Standard | | |
| Signal_2&[3] | BIT | Read/Write | Standard | | |
| Signal_2&[4] | BIT | Read/Write | Standard | | |
| Signal_3&[1] | UINT16 | ReadOnly | Standard | | |
| Signal_3&[2] | UINT16 | ReadOnly | Standard | | |
| Signal_3&[3] | UINT16 | ReadOnly | Standard | | |
| Signal_4&[1] | UINT16 | Read/Write | Standard | | |
| Signal_4&[2] | UINT16 | Read/Write | Standard | | |
| Signal_4&[3] | UINT16 | Read/Write | Standard | | |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**Note:**

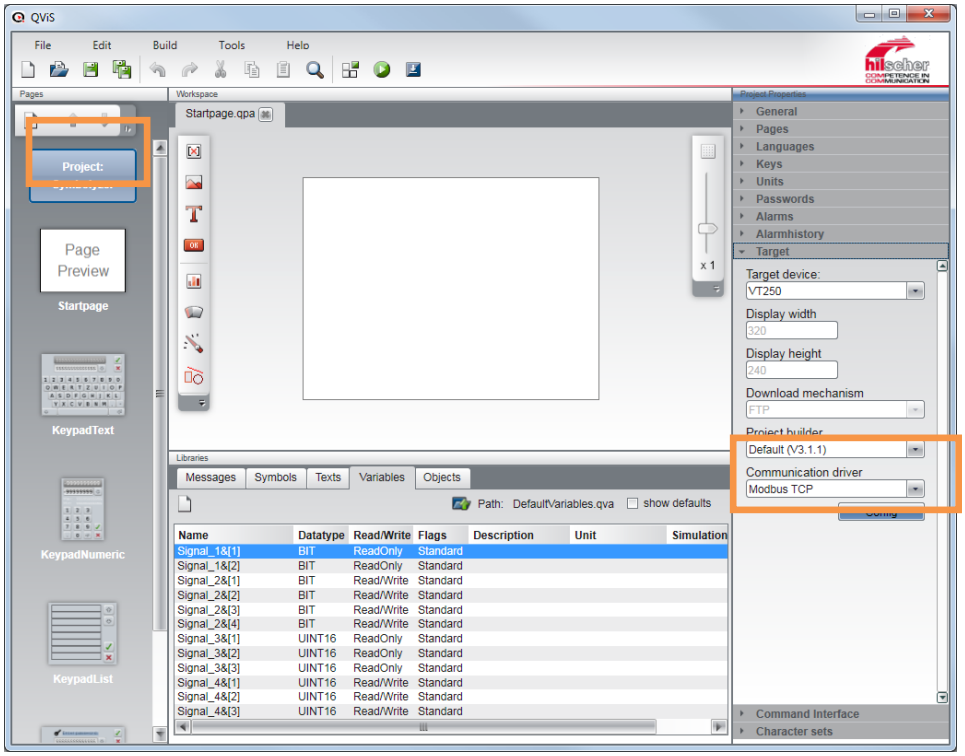
QViS divides arrays imported to QViS into individual elements.

Arrays are recognizable by the spelling "Array&[n]," whereby "Array" stands for the variable names and "&[n]" for the number of the element within the array.

### Step 8: Parameterizing the local connection settings

In the previous steps, the variables were declared and imported and the connection parameter (e.g., target address) specified. Now the local communication parameters must be set.

In "Project Properties" you will find the driver settings under the "Target" settings.




Depending on the driver, a "Config" button is proffered, via which the local communication parameters can be set.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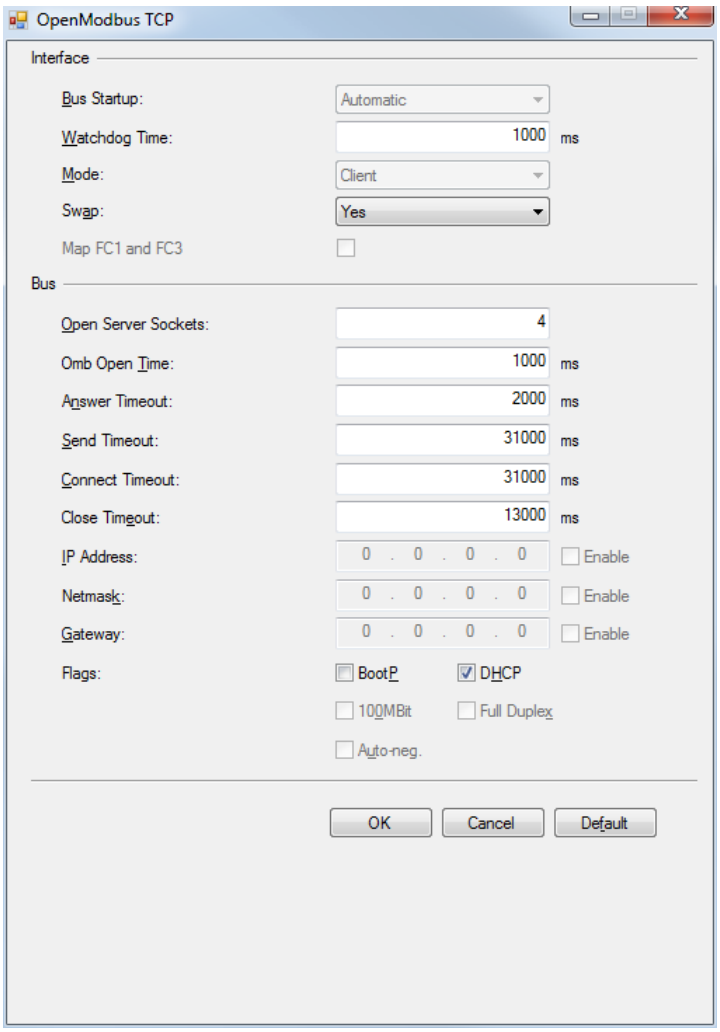


**Note:**

Depending on which driver and device is used, it can happen that some of the settable functions are disabled (grayed).

The editable parameters should be accordingly adapted to the application – in most cases, however, the default parameters can be taken over without any modifications.


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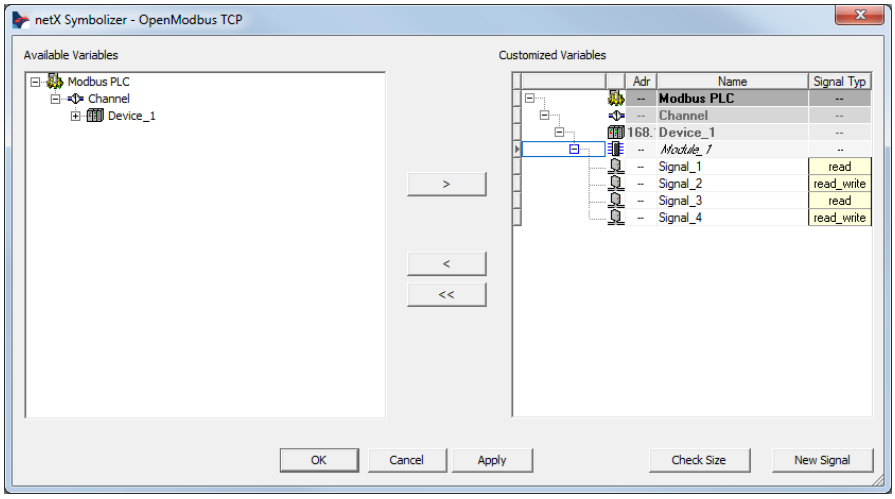
**Step 9: Changing existing variable configurations**

To change/delete/add variables, simply relaunch the Symbolyzer.




## 4.10.3 Importing from a Simatic Project

Unlike most other fieldbus drivers, the drivers for MPI/Profibus and RFC1006 used in the Simatic environment offer the option of reading in the symbols from STEP7 projects.

**Task:**

With the help of the Symbolyzer, symbols/variable in a STEP7 project are to be made available to QViS.

**Note:**

Configuring variables is performed in the same manner for all supported drivers. Depending on the fieldbus, however, the properties of the variables are parameterized.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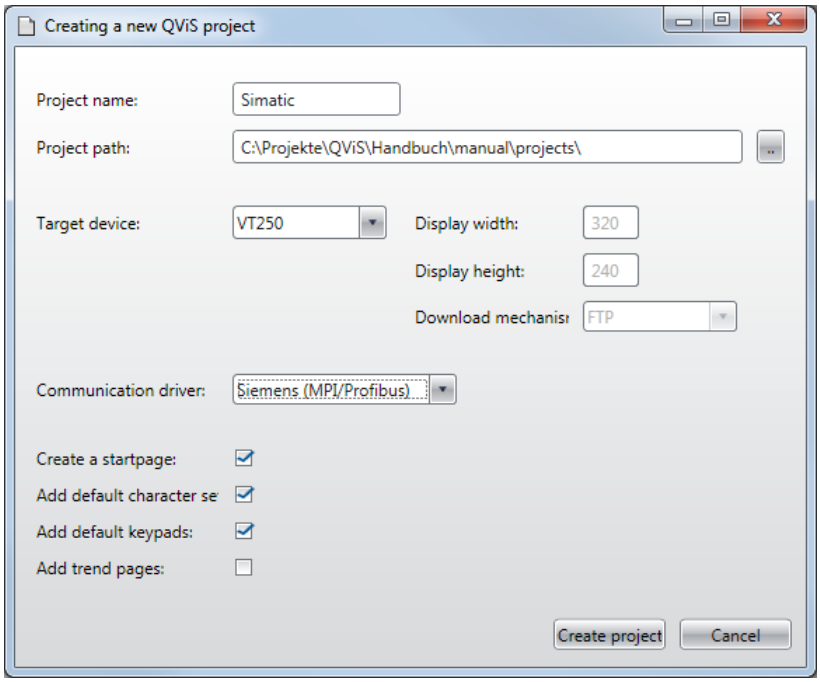
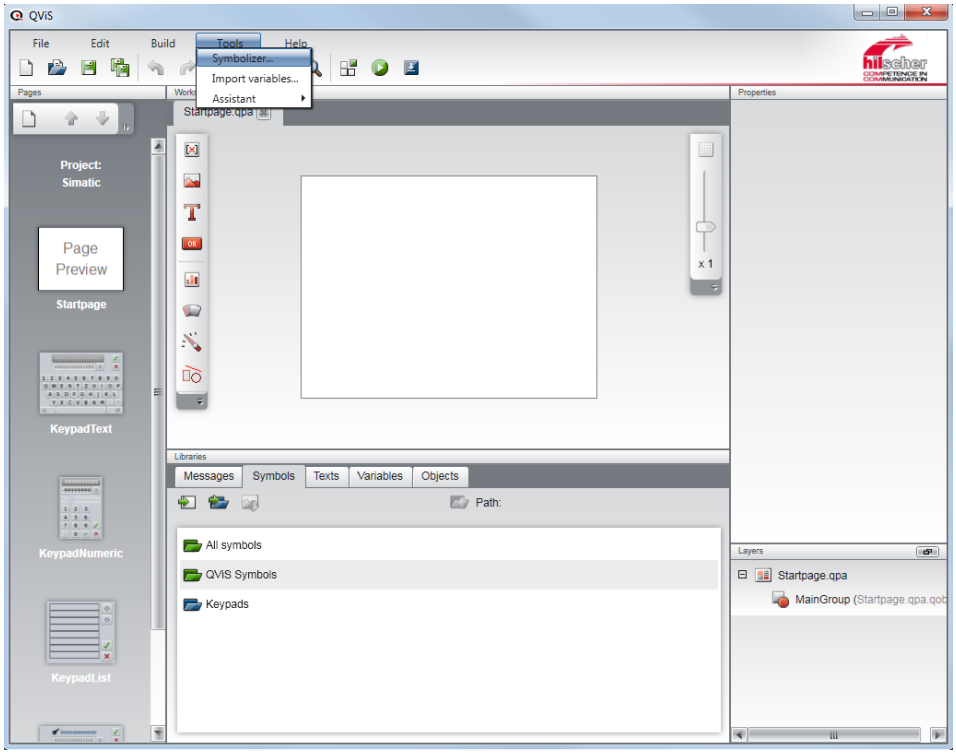
### Step 1: Create a new project

Create a new project (Menu File, New project…) and select the following settings:




### Step 2: Launching the Symbolyzer

Open the Import Dialogue (Menu Tools, Import variables, Symbolyzer).





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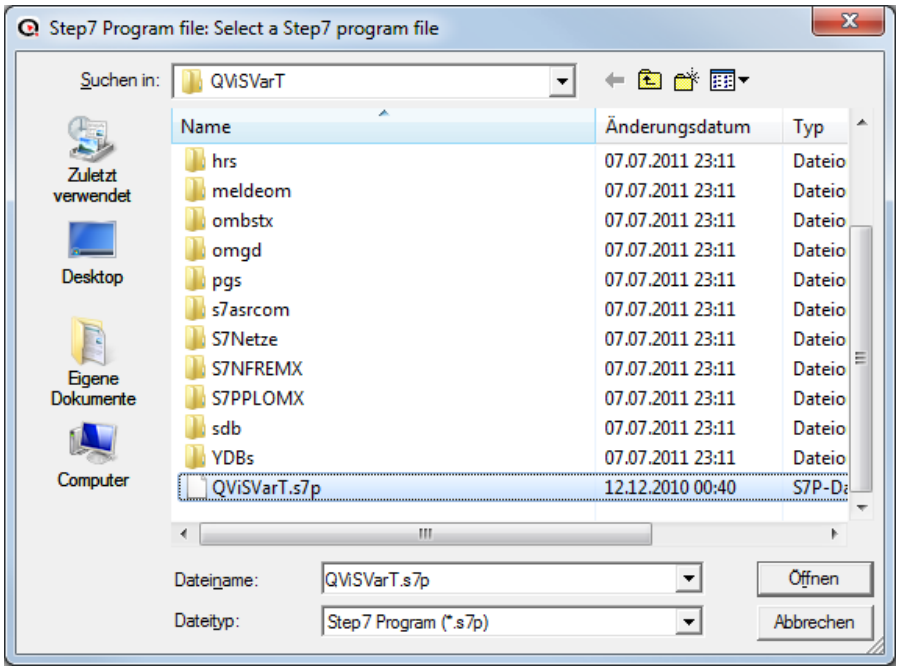
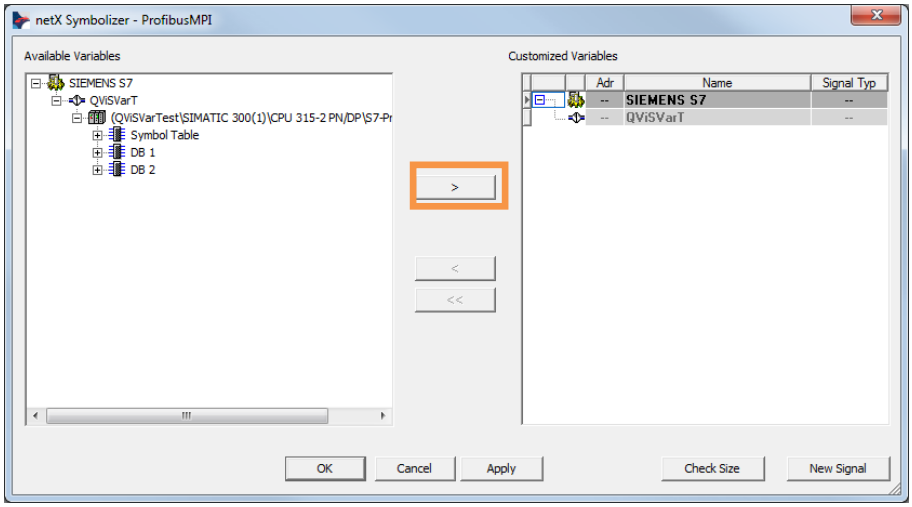
### Step 3: Reading in the symbols of a STEP7 project

Before the Symbolyzer is opened, a request is displayed requiring you to select a Simatic project. Select an *.s7p file and open the file:




### Step 4: Selecting the desired modules and signals in the local configuration.

In the launched netX Symbolyzer, you can now copy modules and signals of the read in project from the left window into the right window.





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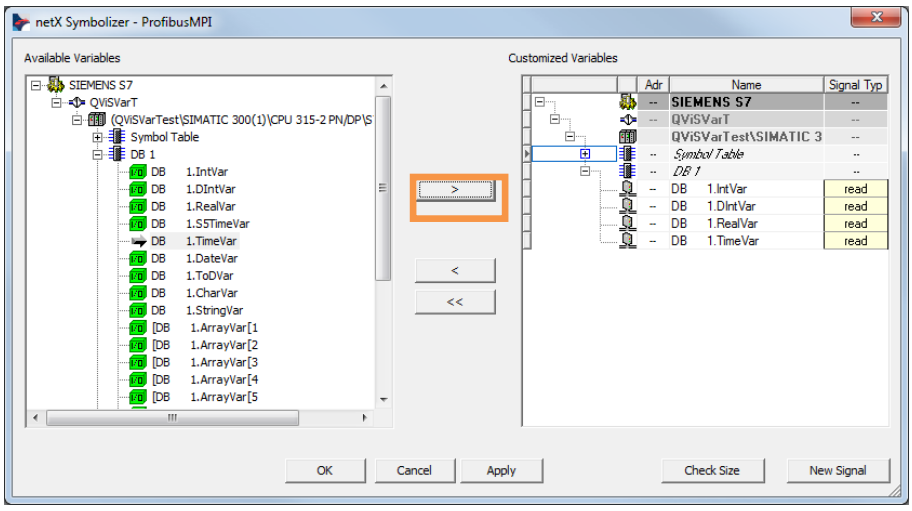
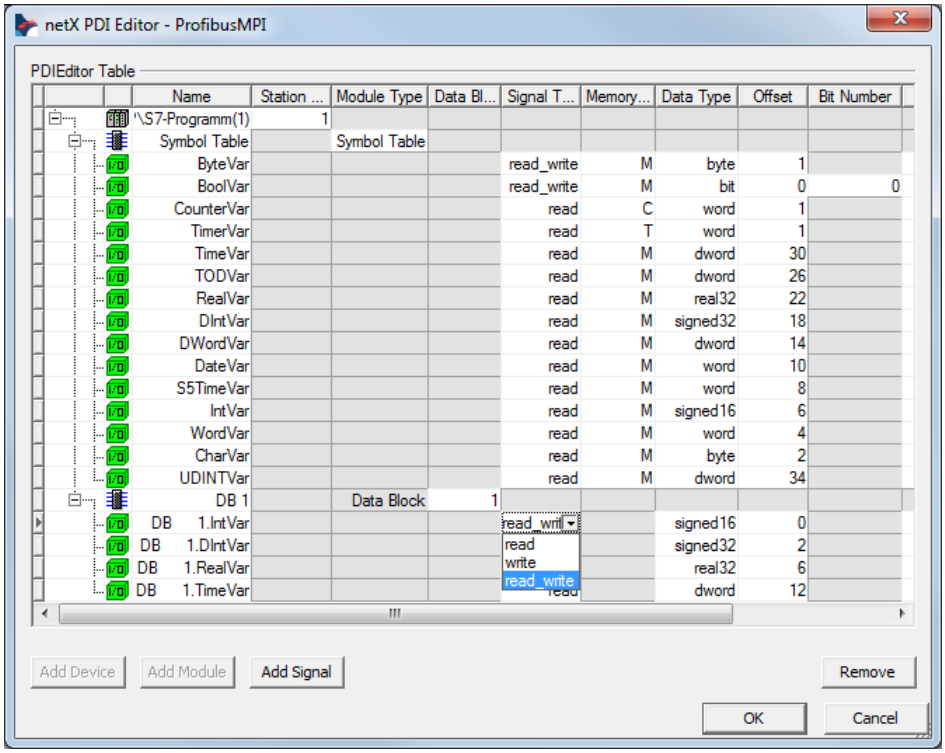



**Step 5: Manually creating further modules and signal, as well as assigning target station addresses:**

The PDI Editor is opened via the "New Signal" button. Further modules/signals can be created here, existing modules/signals manipulated, as well as station addresses of the communication partners defined.




**Note:**

Per default, all signals are set to ReadOnly. When write access from individual signals is desired, this must be set in Symbolyzer or in the PDI Editor.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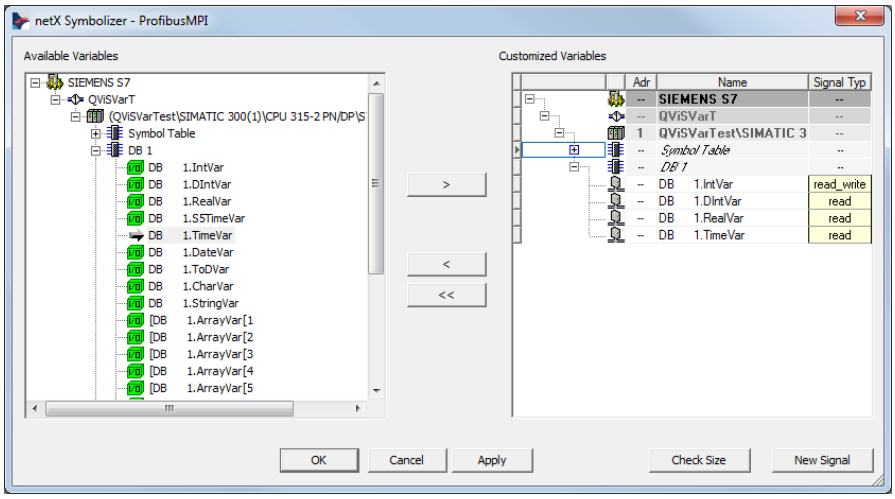
### Step 6: Quitting the Symbolyzer

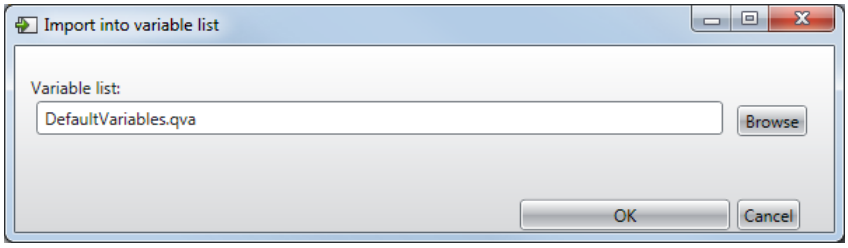
The Symbolyzer can be closed after quitting the PDI Editor via "OK" or "Cancel."




When closing the Symbolyzer, a rudimentary plausibility check is performed. If, for example, the user forgot to enter a target address, an error message containing explanatory information is displayed.

### Step 7: Take over all variables

In the last step, you have the option of saving the variables in a desired QViS variable table (file extension *.qva). "DefaultVariables.qva" is offered as the default.





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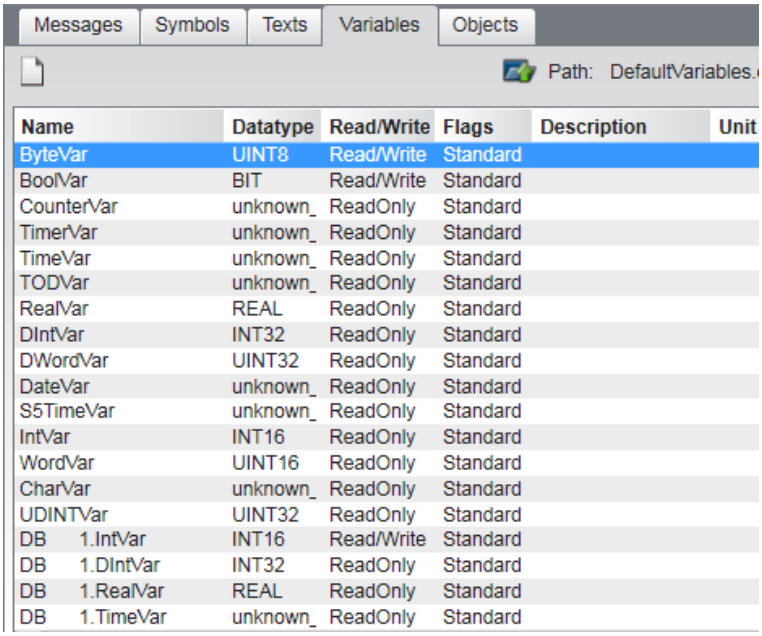
### Step 8: The variables are now available in QViS




| Name | Datatype | Read/Write | Flags | Description | Unit |
|---|---|---|---|---|---|
| ByteVar | UINT8 | Read/Write | Standard | | |
| BoolVar | BIT | Read/Write | Standard | | |
| CounterVar | unknown_ | ReadOnly | Standard | | |
| TimerVar | unknown_ | ReadOnly | Standard | | |
| TimeVar | unknown_ | ReadOnly | Standard | | |
| TODVar | unknown_ | ReadOnly | Standard | | |
| RealVar | REAL | ReadOnly | Standard | | |
| DIntVar | INT32 | ReadOnly | Standard | | |
| DWordVar | UINT32 | ReadOnly | Standard | | |
| DateVar | unknown_ | ReadOnly | Standard | | |
| S5TimeVar | unknown_ | ReadOnly | Standard | | |
| IntVar | INT16 | ReadOnly | Standard | | |
| WordVar | UINT16 | ReadOnly | Standard | | |
| CharVar | unknown_ | ReadOnly | Standard | | |
| UDINTVar | UINT32 | ReadOnly | Standard | | |
| DB 1.IntVar | INT16 | Read/Write | Standard | | |
| DB 1.DIntVar | INT32 | ReadOnly | Standard | | |
| DB 1.RealVar | REAL | ReadOnly | Standard | | |
| DB 1.TimeVar | unknown_ | ReadOnly | Standard | | |

**Note:**

Variable types imported to QViS that are not supported by QViS are marked as "Unknown."

Using these variables within the scope of a QViS project will prohibited by the compiler.

### Step 9: Parameterizing the local connection settings

In the previous steps, the variables were declared and imported and the connection parameter (e.g., target address) specified. Now the local communication parameters must be set.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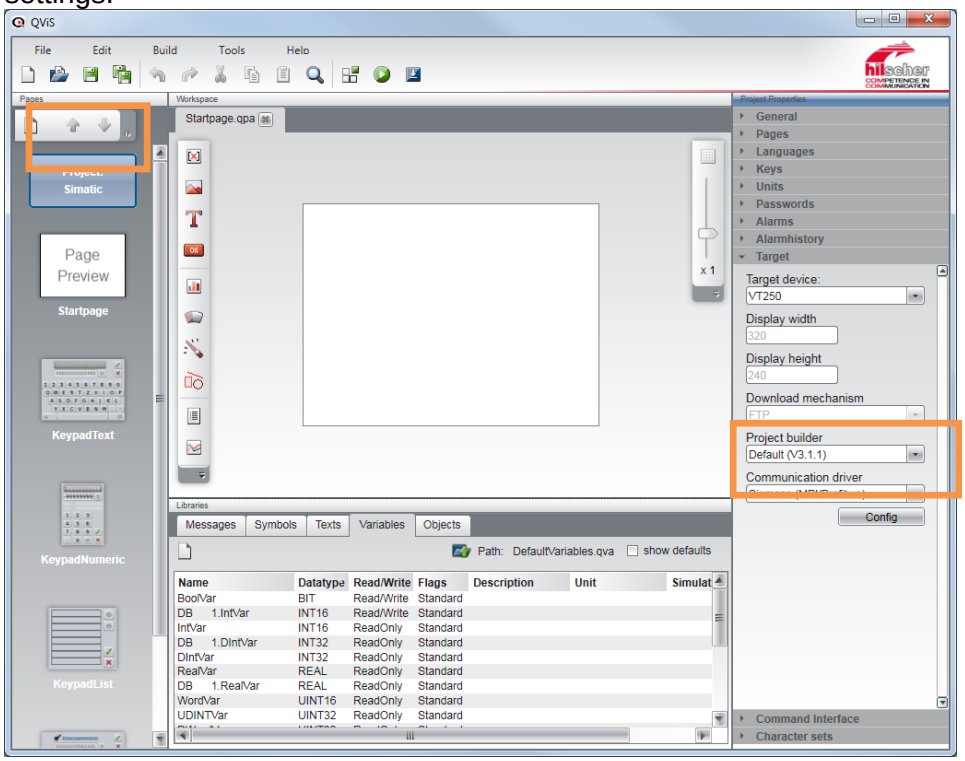
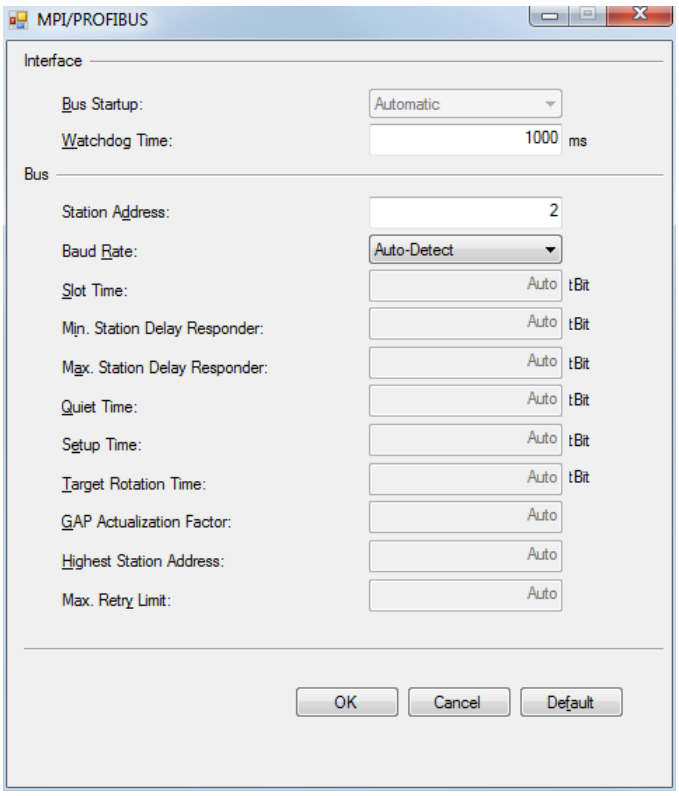
In "Project Properties" you will find the driver settings under the "Target" settings.




The local communication parameters are set via the proffered "Config" button.




**Note:**

Depending on which driver and device is used, it can happen that some of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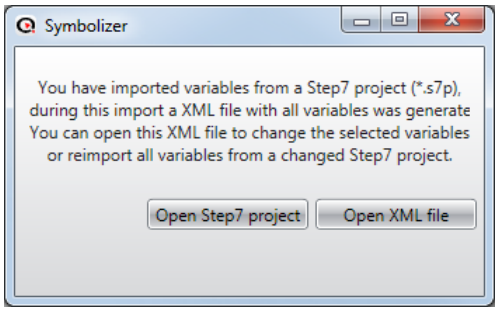
the settable functions are disabled (grayed).

The editable parameters should be accordingly adapted to the application – in most cases, however, the default parameters can be taken over without any modifications.

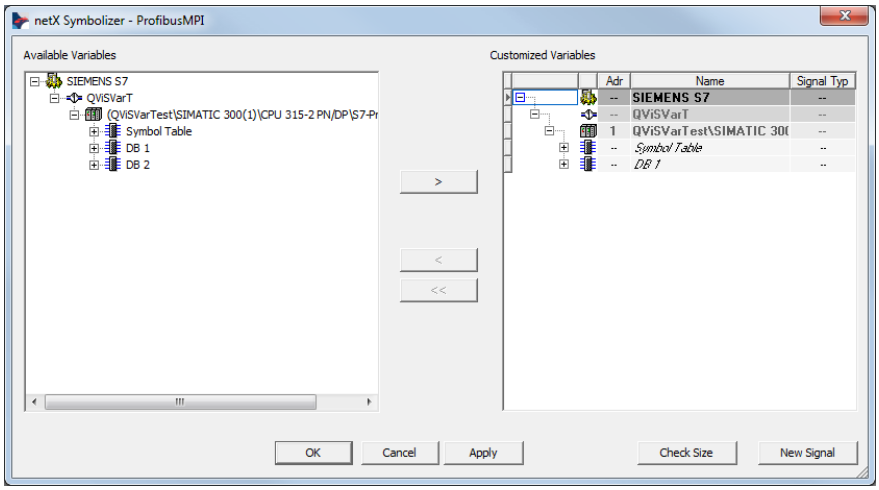
### Step 10: Changing existing variable configurations

To change/delete/add variables, simply relaunch the Symbolyzer.

You will first be requested to decide whether you wish to import a new project (e.g., changes were carried out in the original project) or whether you wish to use the last original project read in as the basis:


Symbolizer
You have imported variables from a Step7 project (*.s7p),
during this import a XML file with all variables was generate
You can open this XML file to change the selected variables
or reimport all variables from a changed Step7 project.
Open Step7 project
Open XML file

Via "Open XML file" you open the existing configuration and can make as many changes as you wish:





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# 4.11 Scaling (Multiplier)

**Task:**

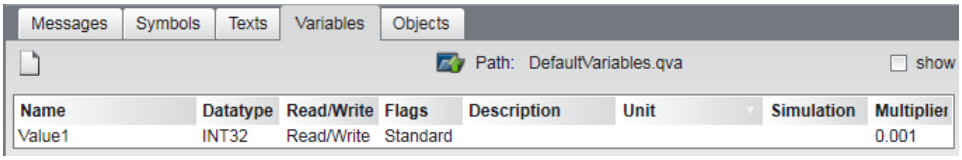
An integer variable with a value range from 0 to 1000 is to be displayed in QViS with 0.000 to 1,000.

**Step 1: Create a new project**

Please first create a new project as described in the previous examples.

**Step 2: Create variables**

Create the following variables:




| | | |
|---|---|---|
| Value1: | Data type: | INT32 |
| | Read/Write: | Read/Write |
| | Simulation Address: | 0 |
| | Multiplier | 0.001 |

**Note:**

The Multiplier can accept values smaller than or equal to 1. Multiplying with 0.1 is possible, but not so with 2.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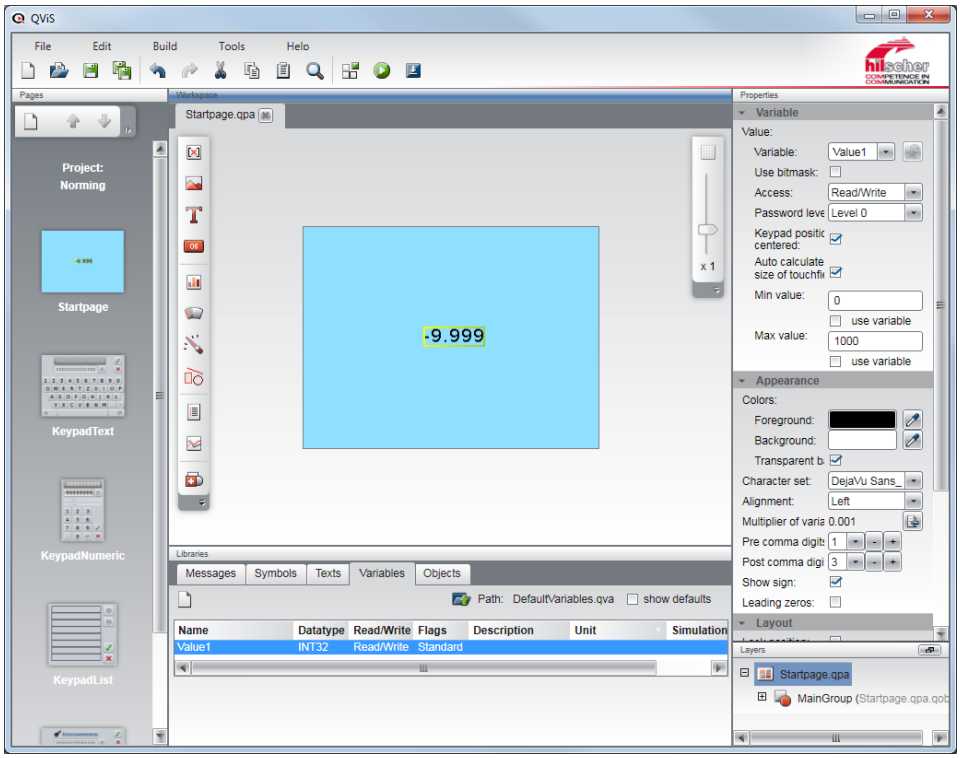
### Step 3: Positioning the element

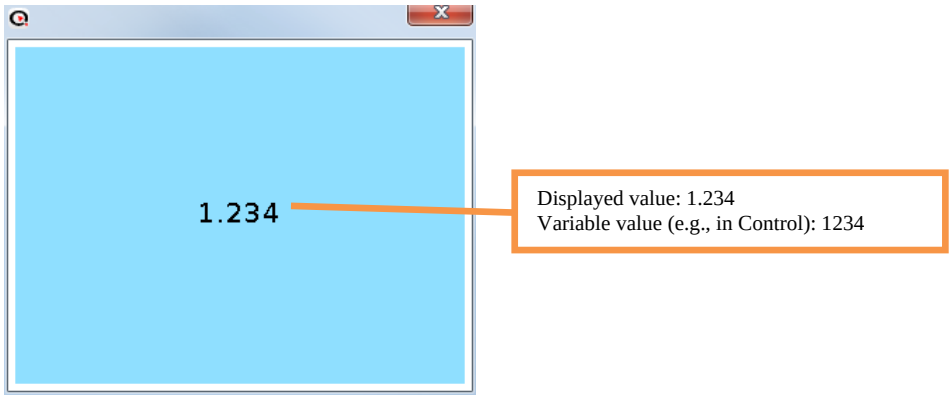
Open the page "Startpage" and position an element "Variable":




| | | |
|---|---|---|
| Variable | Variable: | Value1 |
| | Pre decimal digits: | 1 |
| | Post decimal digits: | 3 |
| | Access: | Read/Write |

### Step 4: Build and simulate the project

Build the project and launch the simulation:




Click onto the variable and change it. It is possible to use up to 3 post decimal digits.

The variable of the displayed value 1,234 has the value of 1234 on the control. If you use QViS to write the value 1 for this variable, the value 1000 is written in the PLC.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